

Proceedings of the
SEMINAR
on

**Plants
Rituals
&
Medicine**



**Dvaita Vedanta Studies and
Research Foundation
Bangalore**

PLANTS RITUALS & MEDICINE

**Proceedings of the SEMINAR on
The trees and plants associated with the Rituals
and their impact on the health**

Edited by

Prof. K.T. Pandurangi and Dr. N.S. Leela

Published by



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RAJ BHAVAN
BANGALORE
GS\19\MSG\06

MESSAGE

I am glad to know that Dvaita Vedanta Studies and Research Foundation, Bangalore proposes to publish the proceedings of the seminar on "Trees and Plants Associated with Rituals and their Impact on Physical and Mental Health" held during May 2004. I was very happy to associate myself with the Seminar by inaugurating it.

Knowledge and understanding emerge through such Seminars. One may call the theme of the Seminar as concern for the environment or the need for eco-centric development, but it is true that we have to avoid many of the problems that have beset society not only in India, but all over the world. Another important advantage of this kind of a seminar is that distinguished scholars participated in it and the latest advances and researches etc., were briefly in a very distilled form were put not only before the knowledgeable delegates, but also before laypersons. Besides, I hope that the scholarly interaction which took place in the Seminar ultimately led to intellectual rethinking and introspection about the subject. It is imperative that such an intellectual exercise of a very high order needs to be passed on to the future generations in the form of a proper book. I am sure that it will be received well by all.

I commend the efforts of the Hon. Director and his colleagues at the Foundation. I send my best wishes for the success of the endeavour.

(T.N. CHATURVEDI)

Dvaita Vedanta Studies and Research Foundation

Seminar on

**'The trees and plants associated with the
Rituals and their impact on the health'**

His Excellency **T.N. Chaturvedi, Governor of Karnataka**

Inaugurated the Seminar on

Saturday, the 8th May 2004

at Gokhale Institute of Public Affairs.



Sri N. Narasimha Rau,

Former Chief Secretary to Govt. of Karnataka, Chairman of Dvaita Vedanta Foundation

presided over the function.

Dr. Timmappa,

Vice-Chancellor of Bangalore University

released the publications.

1. BHAGAVATAM VOL.VII 2. TARKATANDAVAM VOL.I

Sri Yellappa Reddy,

Former Chief Conservator of Forest

delivered the Key-note address.

Preface

Rituals play an important role in Indian Culture. These have social, ethical, aesthetic and medicinal values. A number of trees and plants are utilised in rituals. These have medicinal value.

It is necessary to bring these aspects of the rituals to the notice of modern young men to enable them to realise the role of rituals in Indian Culture. Medicinal values of the trees and plants utilised in the rituals deserves our attention. The flowers, the incense etc used in rituals and the music of prayers have delicate aesthetic sensitivity.

To highlight all these aspects of the rituals, a Seminar on - The trees and plants associated with the rituals and their impact on health was organised. H.E. T.N. Chaturvedi, Governor of Karnataka inaugurated this Seminar. Dr. Timmappa, Vice-Chancellor of Bangalore University released the two publications of Dvaita Vedanta Foundation. Sri Yellappa Reddy delivered the Key-note address. Sri N. Narasimha Rau, Chairman of Dvaita Vedanta Foundation presided.

Distinguished Scholars from the areas of Agricultural Science, Forest Science, Ayurveda and Dharma Śāstra participated in the seminar.

We are grateful to H.E. T.N. Chaturvedi, Dr. Timmappa, Sri Yellappa Reddy and the distinguished scholars who presented the papers.

The papers presented at this seminar are published in this volume. Dr. N.S. Leela has assisted the editing of this volume, sparing her valuable time. I express my thanks to her.

Prof. K.T. Pandurangi

Chairman

Dvaita Vedanta Studies and Research Foundation

Bangalore

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Dr. Srinivasan Bhat		

SEMINAR PROGRAMME

First Session

Chairman : Dr. Veeresh, Former Vice-Chancellor University of Agriculture

Topics : 1. The role of trees and plants in the purification of

- i. Soil — Dr. Veeresh
- ii. Water — Dr. Lakshminarayana
- iii. Air — Dr. Srinivasa Raju

Second Session

Chairman : Dr. R. Nagaswamy, Director of Archeology, Tamil Nadu

Topics : 1. The role of Microbiology in food security and health security

— Dr. Gita Bali

2. Bilva tree and its religious and Medicinal value

— Dr. Ramasubrahmanyam

3. Ex-situ tree groves in village ecosystem — Dr. Balakrishna Gowda

Third Session

Chairman : Sri Harshananda, Sri Ramakrishna Math, Bangalore

Topics : 1. Sthalavrksa temples in Tamil Nadu — Dr. R. Nagaswamy

2. Mutual Co-operation of birds, animals and plants — Sri Dinesh Naik

3. Aroma Therapy — Dr. Rangesh

4. Five Sacred trees — Dr. Mahesh Adkoli

5. Significance of flowers from Religious, Aesthetic and Medical point of view — Dr. R. Ganesh

Fourth Session

Chairman : Dr. Thite, Prof. of Sanskrit University of Pune

Topics : 1. Trees and plants associated with the rituals in Grhyasūtras — Dr. Thite

2. Awareness of bio-diversity in Ancient India — Dr. Krishna Kumar

3. Mutual Support of Insects, trees and plants — Dr. A. K. Chakravarty

4. Tree and Plant products utilised for the care of pregnant woman and child care — Dr. Rohini

Fifth Session

Chairman : Nityananda Bhat, Director, Sukriteendra Oriental Research Institute,
Cochin

Topics : 1. Trees and Plants associated with the Temples in Kerala

— Dr. Nityananda Bhat

2. Medical Rituals in Atharva Veda — Prof. Hampiholi

3. Tulasi and its Religious and Medicinal value — Dr. Raghu Mohan

4. Medicinal value of Pañcha Valkala – Bark of five sacred trees

— Dr. Ahalya Sharma

5. Śodaśopachāra — Sixteen steps of service to God and their Religious,
Aesthetic and Medical Significance — Dr. G.N. Bhat

Sixth Session

Chairman : Dr. S. R. Rao, Former Deputy Director General of Archeology

Topics : 1. Religious and Medicinal Value of Śami, Nimba and Dhātri tree

— Dr. Satyanarayana Bhatta

2. Totemism as a symbol of fertility — Dr. N.S. Leela

3. Madhu – honey, pañchagavya – five products of the cow
and panchāmṛta – five sweet offerings — Dr. Raghu Mohan

Scholars invited to participate in the discussion and offer responses :

Dr. Sunder Rajan, Dr. Indiramma, Dr. K. Rajagopalachar, Vidwan-Satyadhyanaacharya Katti, Dr. Sudha Gopinath, Vidwan Haridasa Bhatta, Dr. A. Ramaswamy, Dr. S.R. Leela, Dr. Nagasampige, Dr. P.K. Gayatri, Dr. Pankaja, Dr. Nagabhushana, Prof. C. Ramanathan, Dr. Ranganath, Dr. Srinivasa Murthy, Dr. Rajamani, Dr. Chingamani, Dr. Yadugiri, Dr. Kannan, Dr. Jayanty.

Prof. K.T. Pandurangi

Hon. Director

Dvaita Vedanta Foundation

WELCOME SPEECH BY SRI N. NARASIMHA RAO

Your Excellency, Dr Thimmappa, Mr Yellappa Reddy, Prof Pandurangi and friends.

I deem it an honour and a privilege to extend to all of you, on my own behalf and on behalf of Dvaita Vedanta Study and Research Foundation, a very warm welcome to the inaugural session of the seminar on "The Trees and Plants Associated with the Rituals and the impact on the health".

Sri T.N. Chaturvedi, the Governor of Karnataka has kindly agreed to inaugurate the seminar. He was a highly respected member of the Indian Administrative Service and occupied several important positions under the State Government of Rajasthan and under the Central Government. He was Secretary to the Government of India in the Ministry of Education and Culture and later the Ministry of Home Affairs. He was elevated to the post of Controller and Auditor General of India in the year 1984 and held that position for six years with great distinction. He became a Member of Parliament in 1994 and continued in that capacity till 2002 when he was subsequently appointed as the Governor of Karnataka. Sri Trivedi was a member of the Indian delegation to the UNO in 1999 and to the UNESCO in 2000. He was conferred an Honorary Doctorate by the deemed university, Lal Bahadur Shastri Sanskrit Vidya Peetha, New Delhi.

Dr M.S. Thimmappa is a great scholar and has distinguished himself in the field of Higher Education. He was Professor of Psychology and Chairman, Department of Psychology, Bangalore University. He was elevated to the post of Vice-Chancellor of the Bangalore University, a post which he has been holding with great distinction. He has kindly agreed to release our Publications Bhagavatham Vol VII and Tarkatandavam Vol I.

Mr Yellappa Reddy was a member of the Indian Forest Service. He was Chief Conservator of Forests and later Secretary to the Government of Karnataka in the Department of Environment. His contribution to the development of our forests is invaluable. He has sponsored a special project under which he wants 3 crores of saplings to be planted and that project is under way. He has also developed a Dhanvanthri Vanam – a special garden of herbal trees and plants in the Bangalore University Campus. He has kindly agreed to deliver the keynote address.

I extend a special welcome to all three of them who have honoured us with their participation in this seminar.

Several Scholars whom we requested to present papers and to participate in the proceedings of the seminar have kindly agreed to do so and are present with us today. Several dignitaries whom we invited to this Seminar have responded to our call.

Likewise, representatives of Electronic Media and the Press have responded to our invitation.

We are honoured by their presence.

Our Vice Chairman and Director of Studies Prof. K.T. Pandurangi deserves to be congratulated on organizing this Seminar, securing the presence of so many dignitaries and scholars and more than all on proposing a subject of great topical interest for the Seminar. He was Professor of Sanskrit in the Bangalore University and is an erudite traditional and modern scholar. He has been honoured by the pontiffs of several Mathas and Centres of Academic Excellence. He

got the Rashtriya Prashasthi in 1989. He was awarded the title of Mahamahopadhyaya by the Sanskrit University, Tirupati in 1996. He was also given the award of "Vidya Sagar" at the tenth world Sanskrit Conference. He will speak about the Dvaita Vedantha Foundation and the subject of the Seminar after His Excellency inaugurates the Seminar by lighting the Lamp.

I once again extend a warm and hearty welcome to all of you and request His Excellency to light the Lamp and inaugurate the Seminar.

ADDRESS DELIVERED BY H.E. T.N. CHATURVEDI, Rajyapal of Karnataka State

Shri N. Narasimha Rau, former Chief Secretary, Karnataka and Chairman, Dvaita Vedanta Centre, Prof. M.S. Thimmappa, Vice-Chancellor, Bangalore University, Prof. K.T. Pandurangi, Hon. Director, Dvaita Vedanta Studies and Research Foundation, Shri Yellappa Reddy, Chief Conservator of Forests and a person who has taken such a continuing and very insightful interest in promoting social forestry and also drawing people's attention to the importance of plants, their protection, preservation and so on, distinguished scholars and participants in the Seminar and eminent ladies and gentlemen.

I deem it a matter of great pleasure. Indeed I am delighted to associate myself with this Seminar on Trees and Plants associated with rituals and their impact on physical and mental health which has been organized by the Dvaita Studies and Research Foundation, Bangalore under the sagacious guidance of Prof. Pandurangi. I must in the first place express my thanks to Shri Narasimha Rau for his very gracious remarks. He has been, if I might say, a former senior colleague of mine and I know how much he is interested in the things which try to help the society in general in diverse fields.

Prof. Pandurangi was known to me by his reputation even before I came to Bangalore. Later on, I have had the opportunity to meet him a few times in various functions and also to listen to him. I glanced through the Retrospect and

Prospect 1983 to 2003 of the Foundation which really outlines for us the achievements and accomplishments of this Foundation along with very laudable objectives for which I think largely the credit goes to Prof. Pandurangi and his other very distinguished colleagues. As I said, I had known him because I have been associated and continue to be associated directly with atleast two institutions. They are the Indian Council for Philosophical Research and the Project on Indian Science, Philosophy and Culture. That is, as most of you are aware, a very important project and I think work of that kind is undertaken once in a hundred years, if not more. A number of times when we discussed the progress of the work that was being done – and a number of volumes, have been published – then Prof. Pandurangi's name would occur in many of the very difficult areas. *Purva Mimamsa* was mentioned where he was of great help. I think one volume is being edited by him apart from helping the project in working out as to what kind of things should contain under a particular discipline.

Knowledge and understanding emerge through these Seminars. Sometimes people are very critical of seminars because too many seminars are held. But one important advantage of this kind of a seminar is that distinguished scholars participate in it, the latest advances and researches etc., are briefly in a very distilled form are put not only before the colleagues, but also before the laypersons. That is a great advantage.

Apart from that the scholarly interaction which takes place in the seminar ultimately leads the scholars who have already made contribution to them may be on certain aspects or certain interpretations etc., which they have resorted to or they thought were the only ones, to a little bit of the intellectual rethinking, introspection about a particular subject. I think that is also a great advantage of the seminar.

I must also congratulate Prof. Pandurangi for a number of publications that he has brought out. One is about the Seminar on Environment to which he referred in his brief but very precise report. You may call it environmentalism or the problems of, as was mentioned by Mr. Reddy, the need for eco-centric development if we have to avoid many of the difficulties that have beset society not only in India, but all over the world. I really found it to be an extremely useful document and was very well brought out. Similarly, I think the volumes that I just had the opportunity to see also bear testimony to the scholarship, the knowledge ability and the very consistent, dedicated endeavors that have gone into the preparation of these volumes. These volumes are mostly reference volumes. People may because of their own interest choose a particular volume or a text and so on. But in general for the common people or even researchers to make use of this knowledge it is necessary that they should have much wider distribution. Distribution of these volumes can only be through Vice-Chancellors like Prof. Thimmappa. A University represents university of knowledge without any barrier. In any case knowledge has been called even by Bertrand

Russell a seamless kind of cloth which cannot be broken into fragments. The other is through the governmental efforts, through various other libraries not only in this country but abroad. I am aware how the Government of India and even the State Governments sometimes make literature available to visiting dignitaries or sometimes they are presented through our High Commissioners and Embassies to different countries particularly to the centres of learning and the universities. It is here that a much more imaginative and concerted effort is very frankly called for. But unfortunately this is the area which somehow or the other always gets neglected though we might call it investment in the future of society. These phrases, unfortunately in operational terms, get relegated to background, but it is necessary.

I noticed Prof. Thimmappa in his very short remarks really referred to the essence of Shrimad Bhagavatam; what was its genesis not only to give Vedavyasa eternal happiness and peace but also make the foundation of peace available to each and everyone of us. Similarly about *Tarkatandava*, he briefly mentioned that it is the relevance of reasoning, significance of reasoning and the processes of reasoning that is extremely important.

Prof. Pandurangi has chosen a very relevant subject and he has been able to gather, mobilize people who would participate in it including some of the persons on the dias. This is not an easy job. I think this is so because of his own interaction, and reputation with the scholarship, scholars and institutions in the

country and abroad. I myself read an article in *The Hindu* about how he collected the manuscripts and later on he was kind enough to send me a small brochure which gave an idea as to what kind of commitment he has to this particular task. I think that spirit of commitment he has been trying to bear upon the work of this Foundation.

You must also have listened with great attention to a very erudite exposition by Prof. Reddy. I am calling him a professor. It is not only those who are Professors who have the knowledge, but those who are vocational or professional are also professors. I think those who try to defuse understanding and knowledge to the people in general are also professors. With his background and understanding he has given us really a perspective for this Seminar. The problems that he referred ranged from Stockholm to Rio-de-Janeiro and then recently the African country and even the Montreal Protocol and earlier the Kyoto University because of the problem of oxidization and gases. He has also referred to various issues in a wider perspective. He has put this perspective in the context of the situation which he also delineated so far as our country is concerned. Then he referred to what has been the thinking of our ancient seers, sages and even our ancestors. The kind of harmony that we have had are always cherished and valued with plants, trees and animal world or birds and so on. He very rightly referred to Sri Aurobindo, Rabindranth Tagore and J. Krishnamurthy to show that this kind of a tradition exists even in modern times. Even they tried to choose the places for their activities and laid emphasis on them. New phrases are coined

like eco-development and so on. But the realization of the need, its implication and the essence of it have been there so far as the Indian sages and seers and our own scriptures are concerned. That is why I must say what Prof. Pandurangi mentioned that these are the subjects and themes which require inter-change and interaction between inter-disciplinary scholars. They may be Earth Scientists, they may be Forest Experts, they may be Agriculturists, Psychologists, Social Scientists and obviously scholars in Sanskrit and Indology because they are much more familiar or conversant about what exists in our literature. That is another very useful thing. While I was listening to him I tried to take into account the cultural plurality and the eco-diversity that exist. He mentioned that the Foundation all along not only in this Seminar but in other Seminars also has done the same. They do enrich the entity called India, the mosaic that is India because of its richness and its variety. It is not the symptom of any kind of a differentiation or something, but it is this diversity which makes the unity possible. It is the basic unity that we have particularly derived from our ancient heritage which makes this kind of a diversity also much more meaningful, whether it is in thought or in the realm of the physical world. I am glad that he is trying to do this.

Particularly I found that the Dvaita Vedanta, as a layman I may venture to add, is a positive approach to life. It is a philosophy of devotion, dedication to duty, optimism and joyfulness. It has a code of conduct which is almost what we like to cherish as the human values. Probably Bhakti becomes the emotional base for this.

The Bhakti movement that Sri Madhvacharya propagated in this country, despite some misunderstanding sometimes, cements the bonds of friendship and fraternity amongst the common people as such. He has looked upon every strata of society.

As was mentioned by Mr. Yellappa Reddy, even plants and flowers are sentient. Sir J.C. Bose himself went to the very skeptical scientists at Edinburgh and other places in Europe. He tried to tell them the same kind of thing. It is being accepted that consciousness pervades and permeates in all kinds of plants.

I had the privilege to be the Chairman of the Joint Parliamentary Committee on Patents. For more than a year we listened to experts from various parts of the country of all disciplines. At that time in order that we conform with the Convention or the International Obligation that we entered into at Marrakesh with the WTO and TRIPS we tried to see as to how we can really try to protect our own interests and our own ancient heritage. What is supposed to be in the public domain has attempted to be encroached upon and patented. A reference was made by Mr. Yellappa Reddy in his remarks as to how we can avoid litigations walking on the razor's edge when there was a lot of pulls and pressures of foreign experts, pharmaceutical companies and the people that they would bring.

When I got Prof. Pandurangi's letter I did not take any time to accept it. At once I accepted the invitation for the simple reason that I had listened for almost one and a half years the experts before we submitted the amended Patents Bill which was unanimously passed by both the Houses where we tried to bring in local experts like Nariman, Singhvi and others apart from other ideological and political hues. We tried to bring that to protect the national interest and ancient heritage. What has been in India for thousands and millions of years in the public domain should not just be misappropriated by a few individuals or countries today. That gave me, frankly for the first time, a first-hand insight into what the plants even micro-organisms that they represent and the value that they hold for the future of our mankind.

Ladies and gentlemen, I would like to congratulate Prof. Pandurangi and Mr. Narasimha Rau who is the leading light in managing this Foundation along with other colleagues for the extremely relevant work that they have done. I also join Prof. Pandurangi in extending greetings to the scholars who have come from different parts of the country. I wish the Seminar all the best. I have no doubt on that score.

Jai Bharat, Jai Karnataka.

○

A PROFILE OF THE ACADEMIC ACTIVITIES OF DVAITA VEDANTA RESEARCH FOUNDATION

Prof. K.T. PANDURANGI

H.E. T.N. Chaturvedi, Sri Narasimha Rau, Dr. Timmappa, Dr. Yellappa Reddy and the distinguished scholars participating in the Seminar.

I take this opportunity to introduce the Research, publication and the other academic activities of Dvaita Vedanta Research Foundation.

The object of the Foundation is to organize the advance study and Research in Indian Philosophy, particularly, the Dvaita Vedanta Philosophy propounded by Sri Madhvacharya. The study and Research in Indian Culture, Sanskrit Literature and other allied subjects that have a bearing on contemporary life and thought is also the object of the Foundation. This study is interdisciplinary type with a critical perspective. As we live in a multicultural society, a comparative approach with a cross-culture background is also adopted. In short the relevance of Ancient wisdom to modern time will be brought out.

The message of Dvaita Vedanta is stored in a vast literature developed over last 700 years. It consists of original works, commentaries and sub-commentaries. Many of these are still in palm leaf and country paper manuscripts. So far Dvaita Foundation has critically edited forty Sanskrit works and published with detailed introduction incorporating the research points. Some of the large works are published in more than one volume. The total quantity of the publications is a little

more than twenty thousand pages printed on good Maplitho paper with attractive binding and get up.

Since the publication of the critical editions of Manuscripts is a slow process we preserve the manuscripts by digitalization and store in C.D. For this purpose a Computer centre is set up.

For advance Research a good reference Library is necessary, we are developing a good library.

Library facility and Research guidance is provided to foreign Research students and the students from the other states. About half a dozen foreign students take the benefit of this facility every year.

A quarterly Research News letter is issued. We extend our cooperation to Sister Institutions and receive the same from them.

Organizing the seminars is an important programme. We organize these with the co-operation of the Indian Council of Philosophical Research and The Project of Indian History, Philosophy, Science and Culture of Dr. D.P. Chattopadhyaya.

I particularly mention the seminar on the awareness of environment in puranas.

The Seminar on 'The creative development in Indian Philosophy' brought to light the fact that more than two dozen new philosophical works in Vedanta, Nyaya, Mimamsa and Samkhya were written during 19th and 20th Centuries. This removed the

impression that the writing philosophical works in Sanskrit has come to a stand still by the end of 18th Century.

The present seminar has a novel theme.

There is an old slogan 'that there is no plant that is not a medicine.' This slogan is completely forgotten by modern man.

Trees and Plants help the man in several ways.

- i. Trees purify the soil, water and Air
- ii. Store underground water.
- iii. Provide food and nourishment of birds, animals, men and even insects.
- iv. Heal the injuries, improve the eye sight, cure all kinds of diseases, arrest the depression and restore the mental health.

Our ancestors knew this rich contribution of the trees and plants for the welfare of man. They reciprocated it by taking care

of the plant world. They made the Trees and Plants a part of their social and religious life and enjoyed their aesthetic and medical value.

These aspects will be highlighted in this seminar. Distinguished scholars from the areas of forest science. Botany and Microbiology, Ayurveda and Dharmasastra are invited for this Seminar. Some of them have come from Chennai, Cochin, Pune and Mangalore. I welcome these distinguished scholars and thank them for their co-operation.

I am glad to inform the scholars that Sampurnananda Sanskrit University of Varanasi has granted affiliation to Dvaita Vedanta Foundation for registering the students for Ph.D. Degree from this year.

Thanking You.

○



BUILDING OF DVAITA VEDANTA FOUNDATION



"ECO-CENTRIC CULTURE" – A ROAD MAP

[Keynote address]

Shri A.N. Yellappa Reddy

Dharini, 9C, 5th Block, MHS - HSR Layout, 6th Sector, Bangalore 560 034

Our ancestors were aware that all life on earth shares a common ancestry and they were also aware that this planet is being shared by 5 to 50 millions of animals and microorganisms. They knew each species has a value of its own, as well as right to live and each one plays a vital role in the web of interdependence. Especially trees nurse the life. They clean and purify the air without which life would be impossible.

All creations help each other to maintain an invisible delicate balance as well as Evolutionary Process. Their loss or extinction is an invaluable erosion and mutilates the Evolutionary Processes which directly affects the ecological rights of living creatures. These ecological rights have much higher value than human rights in terms of survival of the planet.

These species is a specific habitat and their genetic diversity displays highly evolved expression of life. Our Ancestors accepted them as a part of their daily life. Because they were fully aware that life and livelihood depend on this genetic diversity. The latest invention of human genome discloses that the hand of evolution in human genome which surprised the world that the man shares genes and many associated chemical pathways not just with apes but even with bacteria. Gene regulations in flies, worms, ants and mice unravel similar process in man for eg., ants unlike motorists altruistically handling the problem of traffic congestions. Name any problem which man is facing today they do have the similar problems but they solve their problems with exquisite rules of thumb which are simple, elegant and incredibly effective, whereas man is messing everything and complicating his life and endangering life of all living creatures on the planet.

The Bio-Diversity and Genetic Diversity are essential to maintain the chemical composition of the atmosphere, stratosphere, ionosphere as well as biosphere and hydrosphere and also salt contents in the ocean. The distribution of trace elements among plants and animals in marine ecosystem, aquatic ecosystem and terrestrial ecosystems are vital for existence. Any radical human interventions such as, interlinking of rivers and preventing fresh water flow through estuary's to marine ecosystems will destroy the rich biodiversity in marine ecosystems.

Tropical Marine Ecosystems hold 70% of the world's biodiversity. All this dynamic functions are regulated by intertwined cooperative network in cyclic renewal of life formats, which are perfectly designed. These networks, cyclic designs exhibit immaculate properties of self regeneration, self regulation path ways which are perfectly designed. These networks, cyclic designs exhibit immaculate properties of self regeneration, self regulation pathways which are highly complex and evolved over billions of years and continue to evolve which are beyond the human comprehension. Therefore, the planetary system is not only alive but also mindful. Thus there is a need to restore a symbiotic relationship with Flora and Fauna, because all of them posses medicinal and therapeutic properties and also spiritual values. Our doctrine of eco-centric approach of development can prevent annihilation of biodiversity, genetic diversity and the very life of the planet.

The tragedy was persistent till the event of Stock-Holm conference held during 1972. The civilized world did not consider the common principles to protect and preserve the life in the

planetary system. The Stock-Holm declaration proclaims that "the natural resources of the earth, air, water, land, biodiversity in natural system must be safeguarded for the benefit of present and future generations through careful management and for economic growth." An eco-centric approach is essential to safeguard the planet.

Thereafter, Rio, Rio after 5 years and Rio after 10 years vision is "every generation should have water, air and soil resources, pristine and unpolluted. The biodiversity and minerals found on earth shall be undiminished. The United Nations is initiating several steps to protect the fragile mantle of the "Mother Earth".

1981 Supreme Court verdict observed that rivers, forests, minerals and such resources constitute nation's natural wealth. These resources are not to be frittered away and exhausted by any one generation. Every generation owes a duty to all succeeding generations to develop and conserve the natural resources of the nation in best possible way. Whereas, civilized human beings are dumping 8 million tons of carbon into earth's atmosphere every year. Only trees, forests and healthy marine ecosystem can inhale carbon dioxide and transform carbon into wood, food, fodder, flower, medicine, fruit etc. The green canopy alone can filter the air. But in reality, we add carbon, oil to the atmosphere even while doing small alterations such as to turn the car key, turn on a light or just do anything resulting in addition of carbon, oil and hazardous chemicals to Eco-system in industrially driven economy. The trees which can inhale and breathe is stripped off very rapidly from the planet. With the result, we are facing scorching summer, fiercer storms, altered rainfall and many terrible things are happening which man is unable to prevent.

If trees, wetlands, oceans and rivers withdraw their helping hand to purify air and water, man and life in the planet cannot sustain even a fraction of a second. Such being the case, the arrogance of the civilized man is going on brutally and unabated.

Our belief is that the man and all living creatures are entitled for usurpatory rights of god given endowments. Our ancestors strictly prohibited appropriation or abuse of god given endowments. They promoted egalitarian values to fellow creatures and to other life forms.

Since 5 decades, the world's economy is converting vital resources into commodities for profit. The tragedy is that the policy makers are compromising and allowing God given gifts into commodities. Once they commodify the God given gifts, they have scant regard for fellow creatures and other forms of life.

The trend of uncontrolled consumerism is creating serious impacts on ecosystem and to human habitat. These impacts are causing very serious disruptions. With the result, the poor and other living creatures are facing starvation mainly due to destruction of highly productive balanced habitats.

Civilized man has to understand that all living creatures have all virtues such as motherhood, tolerance, mutualism etc. without vices and wickedness. All animals have a well-designed articulated code of conduct. Whereas civilized man have plethora of laws more to violate rather than to respect them.

Therefore, the vision of reality of life is the awareness of the essential interrelatedness and interdependencies of all phenomena especially physical, chemical, biological, social, physiological and psychological as well as cultural and spiritual bondages.

Frontier science is better equipped to understand that every organism from bacterium to wide range of plants and animals to man is Integral and Interlocked. The very same aspect of wholesomeness is exhibited in social systems of ant hills, beehives, the herds of animals and schools of fishes. The web of relationship gains mastery in the ecosystems. Thus, the life and livelihood in eco-centric doctrine is deeply embedded in our culture, which is fundamental to the human survival. The tragedy is that we

have utterly disregarded the eco-rights. Undue importance is given only for human rights.

What we need today is a new vision of reality, a fundamental change in thought perception and values. A civilized society does not reflect the interrelatedness, which exists in nature. To achieve a dynamic balance, a radically different socio-economic structure is needed. The survival of civilization will depend on whether we can bring such a change, before reaching a flash point.

We are fully aware that we are in a state of profound global environmental crisis. Multi dimensional human activities touching every aspect of life support system and making a deep dent by destroying the Life Fabric. Thereby, self-healing ability is being seriously impaired, and the biosphere is in the midst of crisis and humanity is facing a threat of extinction. To quote an example, Mercury is a threat to all life forms. India is the second largest user of Mercury in the world using about 170 to 190 tonnes annually.

Mercury emission in air is increasing astronomically and the present rate is 1 to 1.5 tonnes per year. To contaminate water body of size 20 Acres one gram of Mercury is enough. Mercury is a potent neuro-toxin which affects central nervous system, liver and kidney of human beings. Similarly cadmium, chromium, persistent organic pollutants are causing serious

health hazards. The other side of the coin is by repeated monoculture, the trace elements are depleted in the soil causing all kinds of health hazards for eg. Zinc is associated with enzymes, enzymatic functions, synthesis of proteins, carbohydrates and metabolism. It is an important constituent to animals and plants. Every adult body needs 10 to 15 milligrams of zinc per day but it is not available in the soil because of monoculture and absence of trace elements in the soil profiles.

We are painfully aware that any of the technologies, products including medicines, food are neither safe nor clean today. The toxic elements have invaded underground water, destroyed rivers, tanks and toxic elements are accumulated causing very wide range of health impacts to all living creatures. With the result chronic degenerative diseases are increasing and the rates of suicide, alcoholism, crimes, behavioral disorders are also mounting up. According to socio-pathologists, the society is under great stress. Therefore, the reality lies beyond the material world. According to our ancestors, peace and contentment lies in the spiritual realms, which can be obtained through inner experiences. The inner experiences will blossom only when we nurture eco-centric vision of life. Eco-centric vision can be acquired by subjugation. Through subjugation alone we can understand the unified foundation of life fabric in the planetary system.

ॐ मधुवाता ऋतायते मधुक्षरन्ति सिंधवः

माध्वीर्न सन्तु ओषधीः। मधुनक्तमुतोषसि मधुमत् पार्थिवं रजः।

मधुद्यौरस्तु नः पिताः मधुमान्नो वनस्पतिर्मधुमानस्तु सूर्यः

माध्वीर्गवो भवन्तु नः

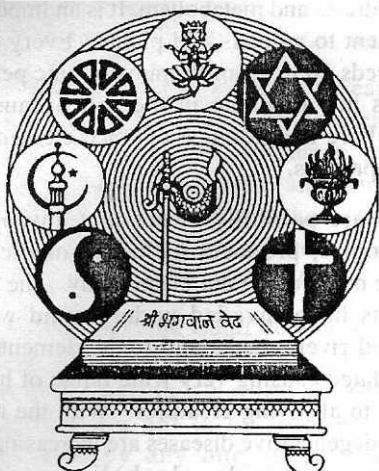
ॐ मधु मधु मधु ॥

(Taittareeya Aranyaka 10-30)



Air be pure, rivers give sweet water, plants provide dietary ingredients, the day be bright. Earth be pure, trees give healthy fruits, sun bless us, cow's milk be unpolluted, let everything be pure and original.

PLANTS AS FACTORIES FOR BIOACTIVE COMPOUNDS



*"All flesh is grass and the good
and the goodness there of is as
the flower of the field."*

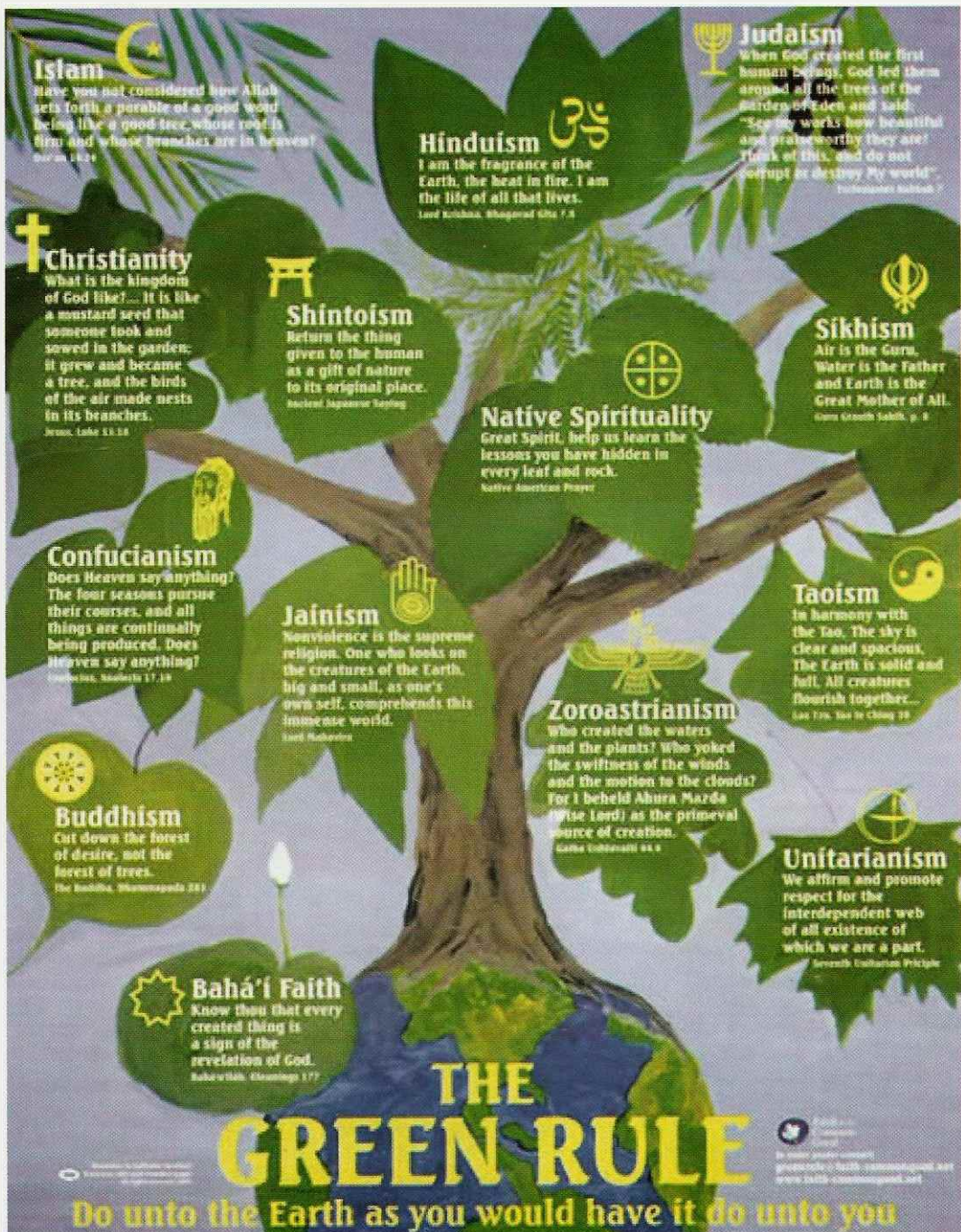
(Isaiah's message in Bible)

*Traditionally plant products are used by man
for food, shelter, clothing, paper and are used
as a source of medicines for centuries. In
addition to all these plants produce oxygen
for our maintenance. Naturally occurring compounds in plants have nutritional,
health giving and pharmaceutical properties. We have to understand how to
turn the biologically active compound found in plants in to new chemistry and
make use of it in a wide variety of different situation.*

*The most important point about plants is that they are clean, eco-friendly
"factories". Producing a wealth of novel, biologically active chemicals with a
major waste products in the form of Oxygen.*

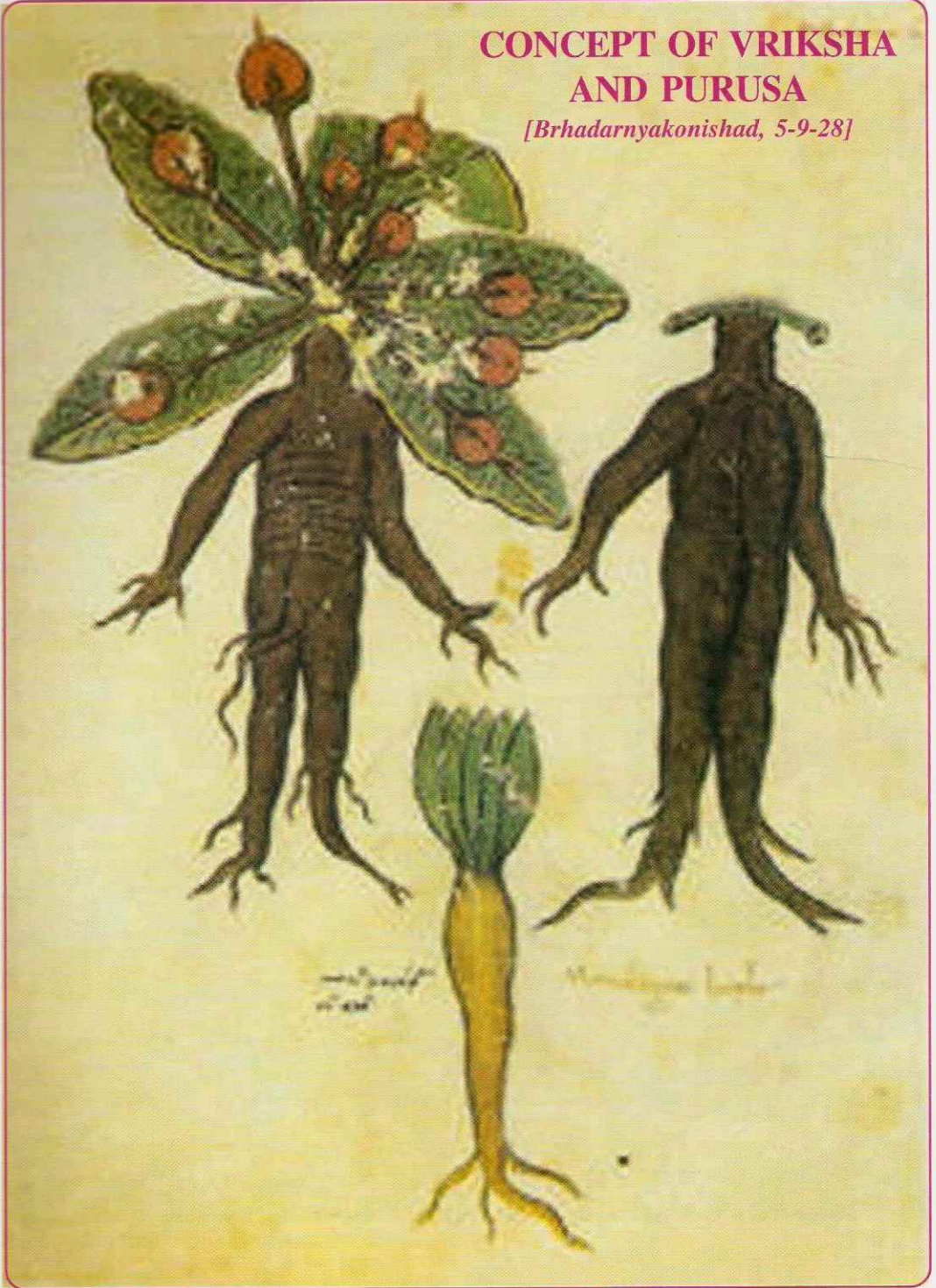
*"At the time that the Lord created the first man, Adam,
He showed him all that He created in the Garden of
Eden. He said "Look how fine and pleasant all that I
created just for you. Give thought that you do not spoil
my world, for if you do spoil it, there is no one that can
repair it after you."*

(Ecclesiastes Rabbah - 7)



CONCEPT OF VRIKSHA AND PURUSA

[Brhadarnyakonishad, 5-9-28]



GREEN RULE

Faith & the Common Good derived the Green Rule poster from the classic Golden Rule found in many major faith traditions. Most are familiar with the Christian Golden Rule: "Do to others as you would have them do to you." In Hinduism it is expressed; "Do not do to others what would cause pain to you." In Islam, "Not one of you truly believes until you wish for others what you wish for yourself," and so it goes in the various faith traditions.

For the Green Rule we are paraphrasing the Golden Rule by saying: "Do unto the Earth as you would have it do unto you." We have looked to the same sacred teachings of many of the world's great religions and spiritual traditions to reveal similar expressions. We have to extend the plea for compassion to all human beings, animals, birds and trees...

To represent creation as a whole we have used a tree as our central image, symbolic of the entire Earth, its various peoples, creatures and ecosystems. You will notice on the poster that there is only one tree but many different species of leaves. This is intended to express the old adage 'unity in diversity.' Each leaf represents a different faith tradition, and most are significant to the faith it represents. To Hindus, for example, the banyan tree represents fertility, love, and life, and it is believed to be home to holy trinity of Hindu gods (Brahma, Vishnu, Shiva). Buddha found enlightenment while meditating under the bodhi tree, and bodhi trees are found next to Buddhist temples throughout Asia. Mohammad was said to have compared a good Muslim to a palm tree, and stated that planting such a tree was a satisfactory substitute for alms.

Faith & the Common Good hopes the Green Rule will not only make us all more grateful for and protective of trees. Our aim is to help people of all faiths and philosophies make their contribution to the conservation of creation according to their beliefs and traditions. We hope to encourage people to unearth the ecological sensibilities in their own religion and, perhaps, explore similar teachings of other faiths. As each of us learn the value of diversity, both cultural/religious and biodiversity, we can better contribute to deeper thinking about how the wisdom of all our faith traditions can individually and collectively heal our overstressed planet.

CONCEPT OF VRIKSHA AND PURUSA

यथा वृक्षो वनस्पतिः तथैव पुरुषोऽमृषा ।

तस्य लोमानि पर्णानि त्वगस्योत्पाटिका बहिः ।।

त्वच एवास्य रुधिरं प्रस्यन्दि त्वच उत्पटः ।

तस्मात्तदा तृष्णात् प्रैति रसो वृक्षादिवाऽऽहतात् ।।

मांसान्यस्य शर्कराणि किनाटं स्नाव तत्स्थिरम् ।

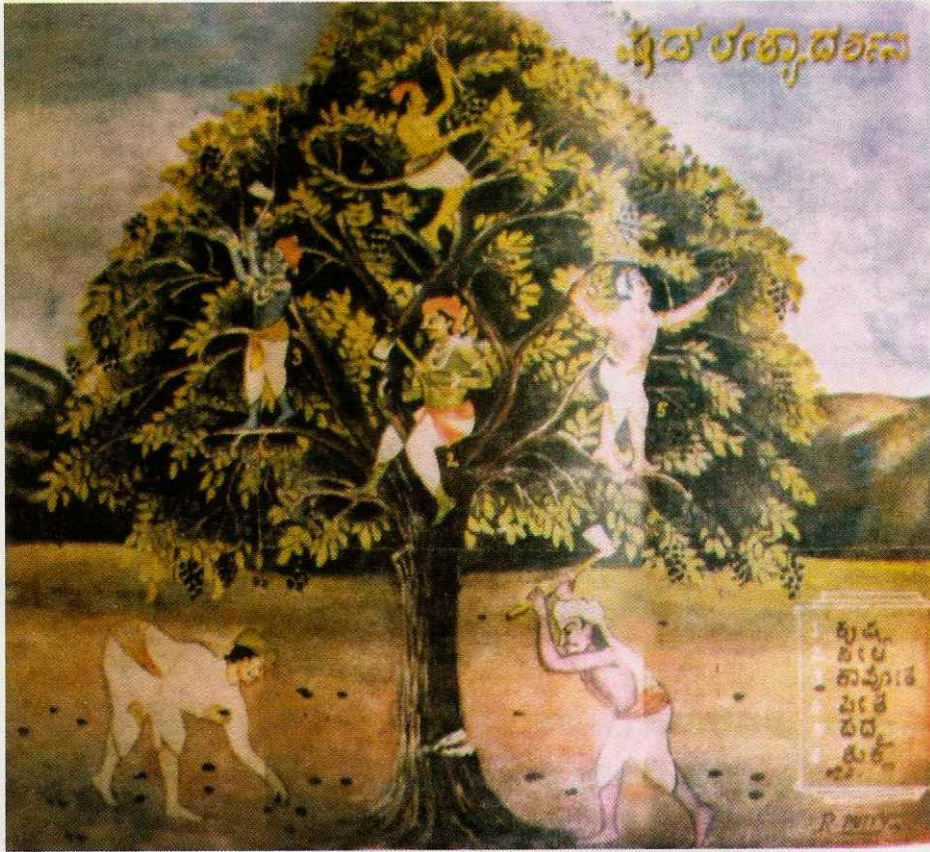
अस्थीन्यन्तरतो दारुणि मज्जा मज्जोपमा कृता ।।

[Brhadarnyakonishad, 3-9-28]

'Vriksha' refers to the characteristics of a tree and so the word 'purusha' to the characteristics of a Jiva. The hairs of purusha are the leaves of the tree. His skin is the bark, his blood is the sap of the tree. Therefore when purusha is wounded the blood flows as the sap from a tree. Purusha's flush is the tree's inner bark, nerves are the inner fibres. Bones are the wood within and bone marrow is the pith.

What is the primary and independent cause of a tree and a purusha? when such a question was asked by the great scholar Yajna-valkya nobody could give a satisfactory answer. When it comes to the scientific clarification one can conclude that whether it is a tree or any jiva the basic unit and composition are the same. विज्ञानं पूर्णज्ञानरूपं ब्रम्हैव This is where science and philosophy merge together.

VRIKSHAPRATIMA



Shadleshadarshana: Six men showing different attitude towards the use of a mango tree (source: Padarthasara, 19th Century, Shravanabelagola Jain temple) Jainism has a very interesting colour-coded concept called the lesya. The colour-scheme for the six lesyas which also include taste, smell and touch is as follows: K rishna/black lesya, neel/blue lesya, kapota/grey lesya, tejo/red or yellow lesya, padma/pink lesya and sukla/white Lesya.

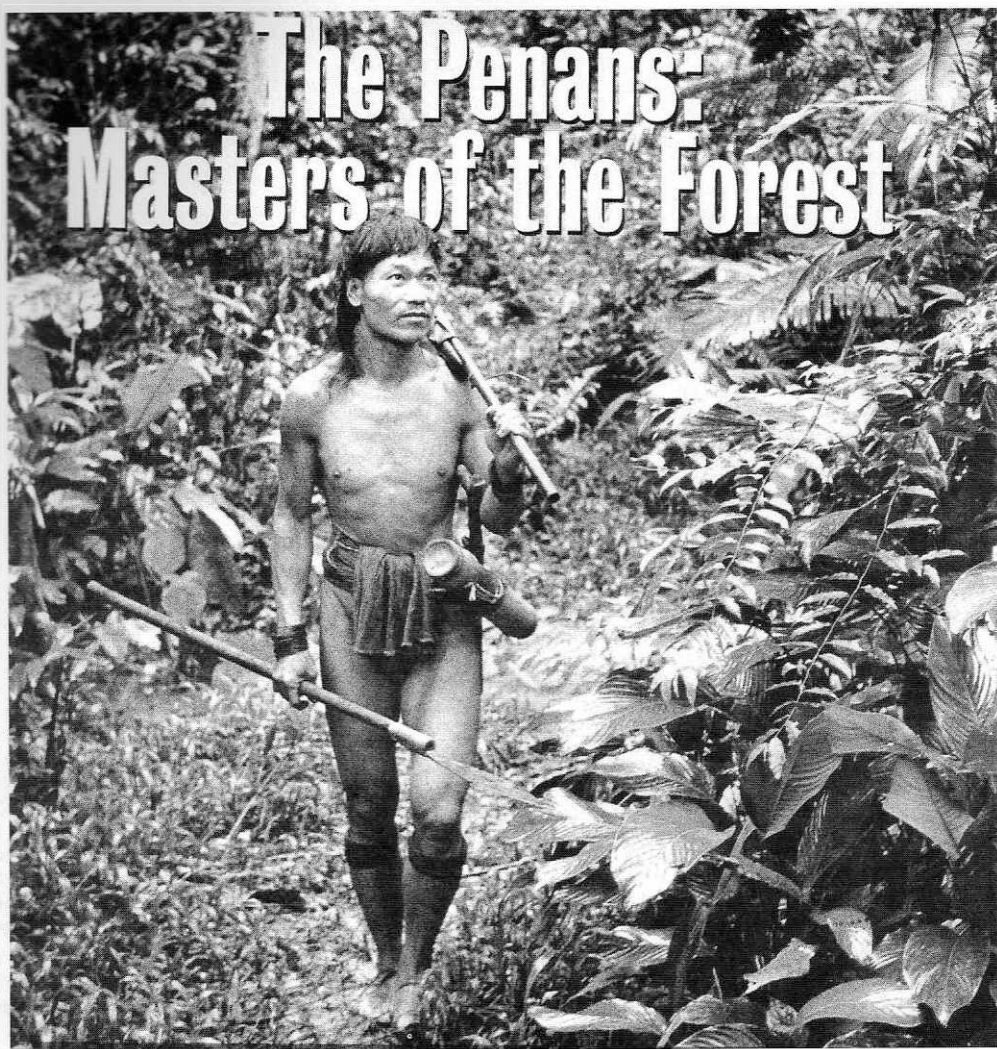
The taste scheme: the taste of the black lesya is infinitely more bitter than that of neem leaves, the taste of the blue lesya is infinitely worse than that of a wild thorn, the taste of the grey lesya is infinitely sourer than that of an unripe mango, the taste of the red lesya is sour-sweet like that of a half ripe mango, the taste of the yellow lesya is sweet like honey while the taste of the white lesya is sweeter than sugar.

The smell scheme: the smell of the bad lesyas (viz of the first three) is infinitely worse than that of a dead cow, dog or snake, the smell of the three good lesyas is infinitely more pleasant than that of fragrance of flowers or perfumes. The touch scheme: the touch of the bad lesyas is infinitely worse than that of a saw, the tongue of a cow, or the leaf of the teak tree, the touch of the three good lesyas is infinitely more pleasant and soft than that of cotton, butter or sirisha flowers. Black is considered the worst & white being the best.

The author of kalpa sutra , K.C Lalwani provides an interesting example. Six persons with these six tinges desire to eat the fruits of a tree. How would they behave? The person with black tinge will cut the tree at the very root.

The one with blue tinge will chop its branches. The one with ash tinge will cut one branch only, bearing fruit for his consumption. The one with red tinge will pluck all the fruits, green as well as ripe ones. The one with pink tinge will pluck only the ripe fruits. The one with white tinge will take only those ripe fruits that have dropped on the ground, but will not touch the tree. The tree is like a golden goose which can give the fruit seasonally but if you are greedy you lose the tree itself.

PLANT AS CALENDER



The Penans are the last of the nomadic hunter gatherers in the world's Tropical rain forests. They are mainly found in remote jungles and roam the forest in search of food and gather wild fruits. This minor ethnic group offer a more fascinating subject for further study.

*The penans have no watches or calendars. But they still use their unique time system. For example if two penans are planning to meet at a specific spot in the forest in 10 days time, each will cut a strip of rattan (*Calamus* sps) and then knot it 10 times and tie the knotted strip of rattan around his waist and set off on his way. Thereafter, as each new day dawns, each of the men – now separated by kilometers of jungle will undo a knot and know right time for the planned meeting.*

These tribe are known for their traditional method of medical practice. They are well versed in identifying medicinal plants in the wild.

THE ROLE OF RITUALS IN INDIAN CULTURE

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Religion and Rituals

The rituals have social, ethical, aesthetic and medical values. There are two types of rituals: i) Family rituals ii) Temple rituals.

Rituals and prayer are the formal aspects of the religion. Reverence to the God and developing a noble conduct worthy of it is the central point of the religion.

Man is born and grown in the midst of Nature. The Nature provides him food, water, air and shelter. Nature is nonsentient. It cannot provide all these on its own initiative. Therefore, man envisaged an invisible power supervising it and bestowing this favour on him. He discovered it intuitively not by logical debate. This invisible power is God. The God as invisible power has no form. However, for the purpose of expressing

reverence for him a form has to be envisaged. Naturally man envisaged a form similar to his own as the form of the God. However, he was aware that this does not exhaust the Gods form. He is transcendental. This is symbolically stated as विश्वतश्चक्षुः विश्वतोबाहुः. For the purpose of worship and prayer different forms are envisaged depending upon the capacity of the worshipper.

अग्नौ क्रियावतां देवः योगिनां हृदये हरिः

प्रतिमासु अप्रबुद्धानां सर्वत्र विदितात्मनाम्

For those who worship God by sacrifice he is present in the fire.

For yogins who meditate upon him he is at their heart.

For the ordinary persons he is in the idols.

For persons of higher knowledge he is every where.



The idols are made in the form similar to man. Therefore rituals are arranged in the form of service to that form. Such as अर्घ्य, पाद्य, अभिषेक, अलङ्कार, धूप, दीप, नैवेद्य etc. while offering this service the devotee takes this human form as devine form and God as present in it. He expresses highest reverence and devotion and completely surrenders at the feet of God. This invests his ritual activity, with religious Sanctity and makes it a religion. Religion is accepted by every civilisation.

In ancient religions like Greek and Egypt, temples were also built. Olympean Gods were worshipped in Greek temples. Sun was worshipped in Egypt temple. This must have been in many other small civilisations in Europe and Middle East. These civilisations were wiped off by Christianity and Islam. Indian religions continue and preserve the heritage of the long past.

Indian religious traditions

There are three important religious traditions in India. Śrauta i.e. vedic tradition. Agama tradition (viz. शैवागम and वैष्णवागम) and शाक्त tradition. There has been a good deal of give and take among these traditions. These are consolidated in the present day rituals.

Majority of rituals are in favour of Śiva, different incarnations of Viṣṇu, Durgā, Pārvatī, Lakṣmī etc. Goddesses and rural deities like Ellamma, Patalamma etc. The main details of rituals are common.

Jain and Buddhist traditions have developed their own rituals.

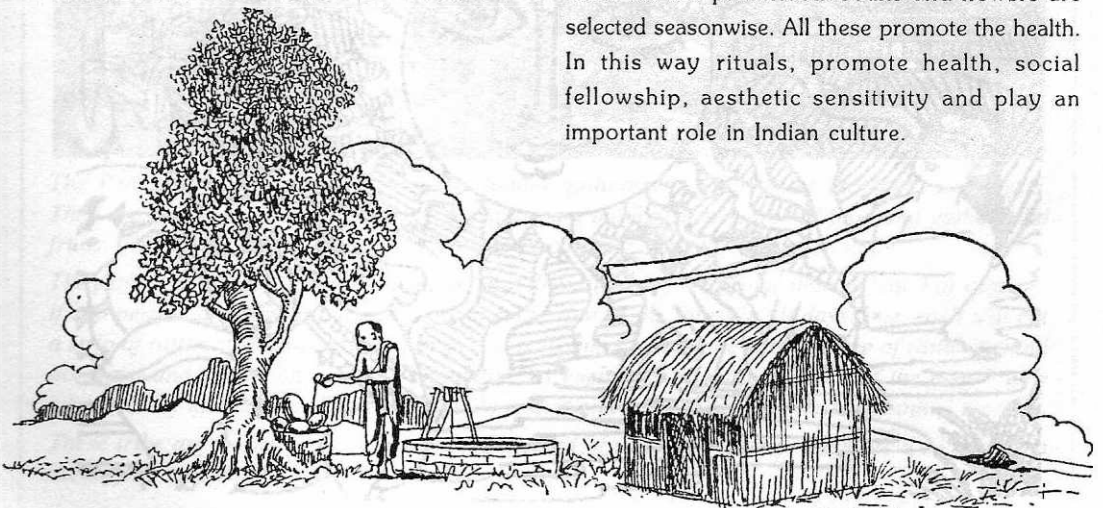
Indian rituals are colourful

The Indian rituals are very colourful. Artistic charts like सर्वतोभद्र are drawn to place the deity, Plantain tree mantapa is erected. Mango leaves are put up as toran. Flowers and fruits are offered. The bell, conch and other musical instruments accompany the recitation of hymns, incense of sandal powder spreads over the puja hall.

This is the aesthetic aspect of the rituals.

All members of the family, relatives and neighbours join the ritual. In the case of temple rituals the whole town joins. At the festival like Ganesha festival, Sivaratri and Navaratri, the entire society participates. This promotes Socio-cultural identity.

In the course of ritual, prāṇāyāma i.e. breathing exercise, mudrā i.e. physiotherapy, oilbath, cow urine etc are prescribed. Fruits and flowers are selected seasonwise. All these promote the health. In this way rituals, promote health, social fellowship, aesthetic sensitivity and play an important role in Indian culture.



Eligibility :

The conditions of eligibility prescribed for undertaking a ritual lay down a sound moral foundation. A person who is honest, who has compassion for all sentient and non-sentient beings, not greedy, not hypocrite is eligible for undertaking ritual.

निजवर्णाश्रमाचारनियतः शुद्धमानसः

अलुब्धः सत्यवादी च सर्वभूतहिते रतः ।

श्रद्धावान् पापभीरुश्च मददम्भविवर्जितः । (ब्र.रा.)

The person who performs the ritual should maintain such pure conduct all along his life. However, in actual practice many persons, both the priest and the performer of the ritual, ignore the cultivation of this conduct and think that a ritual mechanically will provide the result irrespective of the conduct of the performer or priest. This has resulted in the younger generation losing the interest and respect in the rituals. It is clearly stated in the requirements of eligibility that without maintaining a sound moral foundation, performing rituals is विफलश्रम.

The members of all वर्णस are eligible for undertaking the rituals. Women are eligible. Even म्लेच्छस i.e. persons outside the वर्णाश्रम society and tribals are also eligible.

i) ब्राह्मणाः क्षत्रियाः वैश्या शूद्राश्चैव द्विजोत्तम ।

ii) अत्र अधिकारविशेषणस्य पुंस्त्वस्य
अविवक्षितत्वात् स्त्रीणामप्यधिकारः ।

iii) म्लेच्छैरन्यैश्च मानवैः । (ब्र.रा. p.6-7)

Place for rituals

These days the family rituals are performed at home or nearby temples or community halls. However, in the past man always liked to be close to the Nature and function in the open air. In view of this performance of the rituals on the banks of rivers and sea, hills and forests is recommended. Certain holy places are also stated.

i) सर्वे शिलोच्चयाः पुण्याः सागराः सरितस्तथा ।

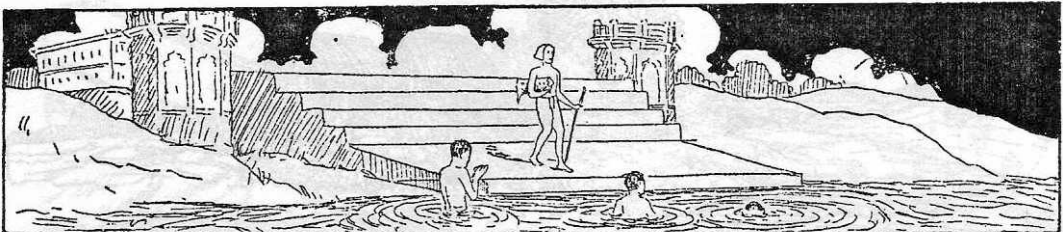
अरण्यानि च पुण्यानि विशेषात् नैमिषं तथा ।

ii) देशो नदी गया शैला गङ्गा नर्मदा पुष्करम् ।

वाराणसी कुरुक्षेत्रं प्रयागं जम्बुकेश्वरम् ॥ (ब्र.रा. p.5)

Appropriate day and time is also prescribed for each ritual separately.

In Modern times we find resorts on seashore and hillocks to enjoy the dance and liquor. In the past people organised the rituals on the sea shore and hillocks. The urge to enjoy in the midst of Nature is common but the purpose for which it is utilised is quite different. There is a radical change in the culture. Modern man probably cannot completely go back. However, he can develop some resorts on sea shore and hillocks for the traditional, cultural activities also. More than this he should not introduce too much of modernity in the existing holy centres like Tirupati, Srisailem, Rameshvaram, Kanyakumari, Mathurā, Kāśī, Gayā etc. Visiting these holy places for observing rituals and worshipping the deity in the respective place has enabled Indians to develop cultural unity. Cultural unity is more fundamental than political



unity. This requires the preservation of the tradition of worship and festivals etc. of the places intact. Majority of these pilgrim centres are under the religious endowment departments of the state Govt. These departments are destroying the tradition in the name of Social reforms. The social reforms should not be thrust on people by Govt. Departments. People should voluntarily bring about the social reforms. Forced social change will destroy the cultural foundation of the nation. In a secular republic, Govt. should not interfere in cultural and religious matter. Infact religious endowment Depts are past legacy. These have no place in a secular Republic. Every religion and every temple has its own tradition. Govt. should not interfere in it. The devotees may voluntarily bring about the change to suit the changing time and changing social outlook. The tradition is a cultural property. Any interference in it will amount to the interference in religious freedom. More than that it will destroy the very cultural foundation of the nation.

Fast :

Observing fast is a preliminary requirement for undertaking the performance of a ritual. This purifies the body. During this period other pleasures also have to be avoided. The fast enables a person to cultivate the virtues viz. compassion for all, tolerance, absence of jealousy, petty mindedness etc. Mere observing the fast is not a sacred act. Developing above virtues while observing fast is a sacred act.

- i) उपवासः स विज्ञेयो सर्वभोगविवर्जितः ।
- ii) उपवासकृतमेते गुणाः प्रोक्ताः मनीषिभिः
दयाभूतेषु क्षान्तिरनसूयाशौचमनायासोऽकार्पण्यम् ।
- iii) गुणानुष्ठानसहितः निराहारस्य
वासः अवस्थानमुपवासः । (ब्र.रा.१२)

Requirements of Rituals

Among the requirements of ritual some common items are stated in the texts that describe the rituals. These are :

1. पञ्चरत्न - Five Jewels

- i) सुवर्णं रजतं मुक्ताः राजावर्तं प्रवालकम्
रत्नपञ्चकमाख्यातम् ।

Gold, silver, pearl, coloured sandstone and coral are the known five precious Jewels.

- ii) If these five are not available सुवर्णं, the gold will serve the purpose of all.

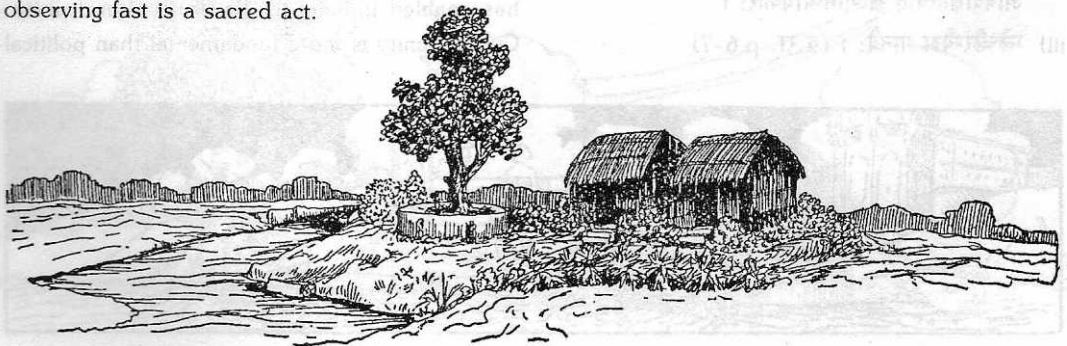
अभावे सर्वरत्नानां हेम सर्वत्र योजयेत् ।

2. पञ्चपल्लव Five Shoots

अश्वत्थोदुम्बरप्लक्ष्मचूतन्यग्रोधपल्लवाः ।

पञ्चभङ्गाः इति ख्याताः सर्वकर्मसु शोभनाः ।

Ficus religiosa (Aswatha), Ficus glomerata (Audumbara), Ficus insectoria (Plaksha), Mangifera Indica (Choota), Ficus bengalensis (Nyagrodha) these are the five well known shoots.



3. पञ्चगव्य Five cow products

गोमूत्रं गोमयं क्षीरं दधि सर्पिः यथाक्रमम् ।

Cow's urine, cowdung, cow's milk, curd and ghee constitute Panchagavya.

4. पञ्चामृत Five nectars

पञ्चामृतं दधि क्षीरं सिता मधु घृतं स्मृतम् ।

(ब्रतराजः 18)

Curd, milk, sugar, honey and ghee constitute Panchamrutha

5. चतुःसम A mixture of four fragrance items

i) कस्तूरिकायाः द्वौ भागौ चत्वारः चन्दनस्य च ।

कुङ्कुमस्य त्रयश्चैकः शशिनः स्यात् चतुस्समम् ।

A mixture of a four fragrance items is prepared by mixing two parts of musk, four parts of sandal, three part of saffron and one part of camphor.

6. सप्तधान्य - Seven grains

यवगोधूमधान्यानि तिलाः कङ्कुः तथैवच ।

श्यामाकं चीनकं चैव सप्तधान्यमुदाहृतम् ।

Barley, wheat, corn, sesame seed, millet, another type of millet and rice form seven grains

7. दशशाक Ten items of plant

मूलपत्रकरीराग्रफलकाण्डाधिरूढकाः ।

त्वक् पुष्पं कवचं चेति शाकं दशविधं स्मृतम् ।

(ब्र रा 19)

Root, leaf, sprout, shoot, fruit, stem, creeper, skin, flower and bark are the ten items of the plant.

8. पुष्पाणि flowers

सेवन्तिका बकुलचम्पक - पाटलाब्जैः

पुन्नागजातिकरवीर रसाल पुष्पैः ।

बित्त्वप्रवालतुलसीदल मालतीभिः त्वां पूजयामि ।

(ब्र रा 135)

Sevanthika (Chrysanthemum), Bakula (Mimusops elengi), Champaka (Michelia), Patala (Bignonia), Abja (Lotus), Punnaga (Calophyllum inophyllum), Jati (Jasmine), Karaveera (Nerium odorum), Rasala (Mango), Bilwa, Red Sandal wood and tulasi are the sacred items of worship.

9. फलानि Fruits

नारिकेलैः पूगफलैः जम्बीरैः बकुलैस्तथा बीजपूरैश्च
नारङ्गैः फलैश्चान्यैश्च भूरिशः कन्दमूलकैः ।

(ब्र रा 139)

Coconut, Betel nut, Lemon, Bakula, Guava, Orange are the fruits to be offered, but according to the season the offerings of different types of the fruits be made.

10. कदलीमण्डपम् Plantain tree pavillion

चतुस्तम्भं चतुर्द्वारम् कदलीफलमण्डपम् (ब्र रा 139)

By erecting four poles and 4 entrances the plantain pavillion be erected.

11. प्रतिमा Idol of the deity

i) सौवर्णी राजती ताम्रा वृक्षजा मार्तिकी तथा ।

चित्रजा पिष्टलेपोत्था निजवित्तानुसारतः ।



आमापात् पलपर्यन्ता कर्तव्या शक्तिसम्भवे ।
अङ्गुष्ठपर्वादिरभ्य वितस्त्यधिका स्मृता ।

- ii) अङ्गुष्ठपर्वादिरभ्य वितस्त्यर्थावेदेव तु गृहेषु प्रतिमाकार्या
नाधिकः शक्यते बुधैः ।

आषोडशात्तु प्रासादे कर्तव्या नाधिका ततः । ।

Idols be made out of Gold, silver, copper, wood and mud. If not according to the capacity of the worshipper a drawing or even the idol be made out of flour be used. The size and weight of the deity be according to the affordability of the devotee.

12. धान्यप्रतिनिधिः Substitute grains

यवाभावे च गोधूमाः व्रीह्यभावे च तण्डुलाः आज्यं
द्रव्यमनादेशे जुहुयाच्च यथाविधि ।

When barley is not available then wheat be used. When paddy is not available then rice be used. When the prescribed Dravyas are not available for sacrifice, the ghee be offered.

13. देवता मन्त्रश्च The deity and hymn

- i) मन्त्रस्य देवतायाश्च अविधाने प्रजापतिः देवता,
समस्तव्याहृतिः मन्त्रः
- ii) प्रणवादि नमोन्तं च चतुर्थ्यं च सत्तम । देवतायाः
स्वकं नाम मूलमन्त्रः प्रकीर्तितः । ।
- i) *If a particular deity is not prescribed Prajapathi be the deity. When particular mantra is not prescribed Vyahruthi is the*

Mantra.

- ii) *In a Mantra the name of the deity is placed in dative. This be prefixed by Omkara and suffixed by Namah. This becomes a Moolamantra.*

14. इध्मा Fuel used for sacred fire

- i) पलाशाश्वत्थखदिरवटोदुम्बुराणाम् ।
- ii) तदभावे करकवर्जसर्ववनस्पतीनाम् ।

The wood or the twigs of Palasha, Peepal, Khadira, Vata and Udambara can be used as fuel for sacrifice. In the absence of these any other wood without thorns be used.

15. धूपः Incense

- i) अगुरुश्चन्दनं मुस्ता सिंहकं वृषणं तथा समभागैस्तु
कर्तव्यो धूपोऽयममृताह्वयः ।

- ii) वृषणम् - कस्तूरी । (त्र. रा. 20)
- Using musk, sandal, aloes in equal proportion incense be prepared which is called Amrutha.*

16. होमविधानम् Procedure of putting offerings in the sacred fire

द्रवः स्त्रुवेण होतव्यः पाणिनाकठिणं हविः ।
सुवपूर्णाः द्रवाः प्रोक्ताः कठिणाः ग्रासमात्रकाः । ।
व्रीहयो यवगोधूमप्रियङ्गुतिलशालयः स्वरूपेणैव होतव्याः
(त्र. रा. 19)

Liquids be offered using a spoon. Rice (Havis) be offered by hand. The spoon be full and handfull of rice, paddy, wheat and sesame be offered in their original form.



17. ऋत्विग् वरणम् Selection of priests

बालाग्निहोत्रिणं विप्रं सुरूपं च गुणान्वितम् ।
सपत्नीकं च सम्पूज्य भूषयित्वा च भूषणैः ।
पुरोहितं मुख्यतमं कृत्वाऽन्यांश्च तथार्त्विजः चतुर्विंशति
गुणोपेतान् सपत्नीकान् निमन्त्रितान्

(ब्र.रा. 17)

A healthy, good natured, having 24 characteristics, who is married be invited as Priest.

Stating these common requirements the procedure of the worship of the deity is described. The particular requirements of each ritual are stated in the context of that ritual.

Placement of the deity and sixteen steps of worship

Before the worship is started Tantric charts सर्वतोभद्र etc. have to be drawn in an artistic way to place the deity. The measurement, the colour and the drawings of these are described in detail. These charts are artistic and are based on certain mathematical formula. These represent both artistic side and the mystic side of the rituals.

At the centre of the chart brahmā is placed. In eight direction eight deities are placed.

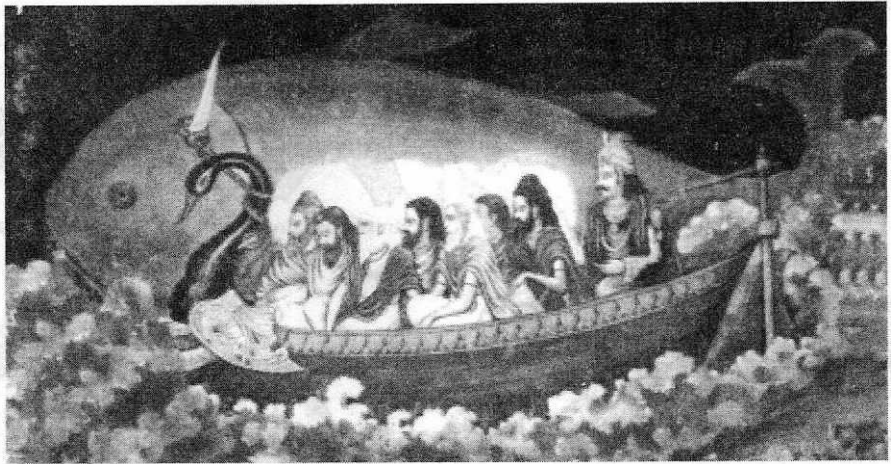
The first step in all rituals is worship of Ganapati. Then the propitiation of नवग्रहदेवता, प्राणप्रतिष्ठा of the deity of the ritual concerned. After this the worship consisting of sixteen steps, designated as षोडशोपचार has to be observed.

- i) अर्घ्यं पाद्यमाचमनं मधुपर्कमुपस्पृशम् ।
स्नानं नीराजनं वस्त्रमाचमनं चोपवीतकम् ।
पुनराचमभूषे च दर्पणालोकनं ततः ।
गन्धपुष्पे धूपदीपौ नैवेद्यं च ततः क्रमात् ।
- ii) पानीयमाचमहस्तवासः ततः परम् ।
ताम्बूलमनुलेपं पुष्पदानं ततः परम् ।
गीतं वाद्यं च नृत्यं च स्तुतिश्चैव प्रदक्षिणा ।

In addition to sixteen steps some more are listed here.

These items indicate highly elite culture, rich artistic life style and delicate aesthetic sensitivity.

Not only these items were offered to the deities, these were offered to the guests, relatives and other participating members of the society. Not only rich people followed this life style but even the middle class persons followed, and also associated poor people on the festival occasions.



Seven great Sages

प्राणायाम and मुद्रा

In the procedure of worship आसन i.e. sitting postures प्राणायाम i.e. the regulations of breathing and मुद्रा i.e. certain formulations of hands and fingers have an important place. Several types of sitting postures are described in the yogic texts. Among these पद्मासन and सुखासन are normally adopted at the time of worship. प्राणायाम is wellknown. It takes away bad breath assembled in the body and provides fresh air.

Mudras form a kind of physio-therapy. About seventeen मुद्राs are prescribed. Among these, seven मुद्राs viz. शङ्ख चक्र गदा पद्म धेनु कौस्तुभ and गरुड are important.

It is well known that the nerves in the palms, fingers and foot control different parts of the body. If these are activated regularly, the body functions properly. The formulation of these मुद्राs is described in detail in तान्त्रिक texts. Here to give an idea two मुद्राs are explained.

- i) कनिष्ठानामिकमध्यान्तस्थात्तदग्रतः ।
गोपिताङ्गुष्ठमूलेन सन्निधौ मुकुलीकृता ।
करद्वयेन मुद्रा स्यात् शङ्खाख्येयं सुरार्चने ।
- ii) अन्योन्याभिमुखस्पर्श व्यत्ययेन तु वेष्टयेत् ।
अङ्गुलीभिः प्रयत्नेन मण्डलीकरणं मुने ।
चक्रमुद्वेयमाख्याता.



Avahanamudra



Samsthapanamudra



Sannidhanamudra



Sannirodhamudra



Sammukhamudra



Avaguntanamudra

Taking bath and before that brushing the teeth is especially stated. Normally neem twigs are to be utilised for brushing the teeth. However a number of other trees are also stated.

जम्बूपामार्गखदिरजातीचूतकदम्बकम् ।

प्लक्षोदुम्बुरखर्जूरी बीजपूरसुदाडिमौ

दन्तकाष्ठद्रुमा एते व्रतिनः समुदाहृताः ।

Bath in the river or pond is preferable. However, on certain special day oil bath is prescribed.

For every ritual an episode of some one performing the ritual and attaining the peace, psychological stability or detachment from the worldly things is appended. These persons are not historical persons but invented by the story teller to bring out the importance of the ritual concerned. Some of these are in the form of dialogue between शिव and पार्वती, नारद and a king and so on. This is a fascinating story collection.

There are a large number of rituals. However, the procedure of their performance is broadly similar. The deity and purpose only differ.

With a view to give an idea of their plan and purpose, a few rituals are described below.

The worship of creator God and his creation on New Year

On the very first day of the year viz. Chaitra Suddha pratipat at the time of Sun rise the worship of the Brahmā the creator God is prescribed. In this ritual the worship of ब्रह्म has to be made with a large canvās. Obeisence has to be expressed for fourteen Manus, the Meru mountain and the regions around it, seven great mountains and the seven great rivers, seven sages, puskara etc holy pilgrim centre, trees, plants and divine architect Viśvakarma.

This will make the worshiper aware of the fact that he is a part of larger world and he should function in co-operation with them. It gives sociocentric perspective of life and disuades from ego-centric approach.

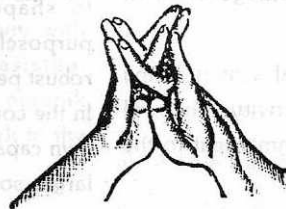
Then the Sun has to be worshipped. Worshipping Sun is designated as आरोग्यव्रत i.e. the ritual for health. This ritual has to be observed throughout the year on the first day of the month.

विद्याव्रत i.e. Ritual to obtain knowledge

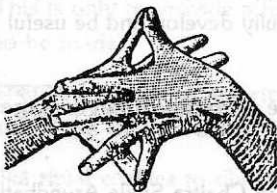
Another ritual on the same day is Vidya vrata i.e. the ritual to earn knowledge. In this ritual the entire sacred literature symbolically has to be placed on the petals of a lotus and worshipped.



Tarkshyamudra



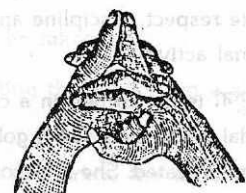
Dhenumudra



Chakramudra



Shankhamudra



Godamudra

अष्टपत्रं तु कमलं विन्यसेत् वर्णकैः शुभैः
ब्रह्माणं कर्णिकायां तु न्यस्य सम्पूजयेत् विभुम् ।
ऋग्वेदं पूर्वपत्रे तु यजुर्वेदं तु दक्षिणे
पश्चिमे सामवेदं तु उदक्चाधर्वणं तथा ।
आग्नेये च तथा ज्ञानि धर्मशास्त्राणि नैऋते ।
पुराणं चैव वायव्यामीशान्यां न्यायविस्तरम् ।
एवं विन्यस्य धर्मज्ञः सोपवासस्तु पूजयेत् ।

Worshipping is a symbolic act. It will instill respect for the knowledge and a sense of responsibility to preserve it carefully and pass it on to the next generation.

The ritual of constructing a pond and providing water

Another important ritual on the same day is constructing a pond to provide water to the people and the cattle living around.

प्रेयेयं सर्वसामान्यभूतेभ्यः प्रतिपादितः ।
अस्याः प्रदानात् पितरः तुष्यन्तु हि पितामहाः ।

In case, one is not able to get a pond constructed, he should supply one jar of water every day to a needy person for four months.

प्रपां दातुमशक्तेन विशेषाद्धर्ममिप्सु ना
प्रत्यहं धर्मघटको वस्त्रवेष्टिताननः ।

एष धर्मघटो दत्तो ब्रह्मविष्णुशिवात्मकः ।

अस्य प्रदानात् सकला मम सन्तु मनोरथाः । (ब्र.रा.७१)

This rituals is of the nature of social service, the three rituals prescribed on the very first day of the year promote health, education and service to the society. The last ritual is popularly known as उदकुम्भदान. In orthodox families supplying one jar of water for a month is still practiced. Unfortunately offering a jar of water to a priest when one is on his death bed is practiced. Many social service rituals have become either nominal or distorted.

Navarātra Festival

In the month of Āśvina Navaratra a nine day festival is to be observed. In North India, particularly in Bengal it is observed as दुर्गापूजा while in South India it is observed as वेङ्कटेश्वरपूजा. It is also called शरदनवरात्र. Achieving victory over the enemies is the main purpose of this festival. On the ninth day war weapons are worshipped. This is popularly known as आयुधपूजा.

These days lorries, cars, printing press all such instruments of different vocations are considered as आयुध, decorated with flowers and worshipped with a view to secure efficient and purposeful service from them. On the tenth day Sami tree is worshipped and Sami leaves are distributed as gold. By crossing the border of the village or town Vijaya yatra is made.

This is an instance of the normal activity being raised to the level of religious activity. This will create respect, discipline and commitment to the normal activity.

दुर्गापूजा is performed in a colourful way. A large pendal is erected. On a golden or artistic throne Durgā is seated. She is decorated with ornaments, garlands and flowers, sixteen steps of puja is offered naivedya of fruits and tasty food are

offered. Music and dance are performed. Here is a combination of art, aesthetics and religious values. Religion is a set of values. Awareness of an invisible power for promoting our interest, protecting us from the calamity, cautioning us to avoid the lapses of conduct, forgiving us for our lapses. We will be able to receive these benefits if we are aware of all these aspects of invisible power. Worship and rituals are formal expressions of the awareness of these aspect. This will induce a noble conduct and commitment to ones duties.

The ritual of the worship of nine girls

As a part of दुर्गापूजा there is another interesting पूजा known as कन्यापूजा. Nine girls from the age group of second to ten are to be worshiped. In each girl वनदुर्गा is present in her different forms.

कुमारिका द्विवर्षा तु त्रिवर्षा तु त्रिमूर्तिका

चतुर्वर्षा तु कल्याणी पञ्चवर्षा तु रोहिणी

षष्ठवर्षा तु काली स्यात् सप्तवर्षा तु चण्डिका ।

अष्टवर्षा शाग्भवी च दुर्गा च नवमे स्मृता ।

दशवर्षा सुभद्रेति नामतः परिपूजयेत् । (ब्र.रा.८३)

The girls be worshiped are of 2 years old called Kumarika, 3 years Thrimoortika, 4 years Kalyani, 5 years Rohini, 6 years Kali, 7 years Chandika, 8 years shambhavi, 9 years Durga, 10 years Subhadra.

Such an elevation at that tender age will generate immense confidence in them and will enable them to shape their future life with dignity and purposefulness. Rituals are meant to develop a robust personality of man than appeasing the god. In the course of appeasing god he strengthens his own capacity to fully develop and be useful to the larger society.

The ritual of the worship of seven sages and Arundhati

On the third day of Chaitra Sukla Arundhati ritual has to be observed. Arundati is known to be very

devoted wife of Vasistha. In this ritual seven sages are worshiped, Arundhati is worshiped along with Vasistha.

The circumstances under which Arundhati worship is prescribed is quite interesting. The episode that is narrated at this ritual informs the circumstances.

There was a learned brāhmin. He had a beautiful daughter. He married her with a suitable person. However, that person died prematurely. Then, the daughter went to the bank of Yamuna river and performed severe penance.

Śiva and Pārvati arrived. They told her that you were a brāhmin in the earlier birth. You married a young girl. After marriage you went on a long pilgrimage. You never returned. Consequently the whole of her life was wasted. To reap the result of this sin you are born as a girl, lost your husband and suffering. One will not have such a suffering if one observed Arundhati ritual.

स्वनारीं यः परित्यज्य निर्दोषां कुलसम्भवाम् ।
याति देशान्तरं चाथ अन्धाश्रमहाण्वि
परदारस्त वा स्यात् अन्यां वा कुरुते स्त्रियम् ।
सोऽन्यजन्मनि देवेशि स्त्री भूत्वा विधवा भवेत् ।
या नारीतु पतिं त्यक्त्वा मनोबाक्कायकर्मभिः ।
तेन कर्मविपाकेन सा नारी विधवा भवेत् ।

The message of this episode is that the husband and wife should be in complete harmony with each other like Arundhati and Vasistha. Introducing the earlier birth etc is only purāṇik style. This is only to provide a frame work to the point to be made.

हरितालिकाव्रत i.e. Haritalika ritual **Love marriage of Pārvati with Śiva**

Haritalikā ritual enables to obtain the bridegroom chosen by the bride. When Pārvati came to the

age, her father Himavān thought of finding out a groom. At this time, Nārada arrived and suggested that Viṣṇu is most appropriate groom and your daughter may be given to him. Himavan agreed. On learning Pārvati felt very unhappy as she had made up her mind to marry Maheśwara. Her friend took her to a distant place. Himavan went on searching her. He was not able to trace her. In the meanwhile Pārvati started performing severe penance, worshiping Īśvara linga made by sand. This moved Īśvara. He arrived at that place and assured Pārvati that he will marry her. At this stage Himavan arrived and agreed for the marriage of Pārvati with Maheśwara.

The ritual performed by Pārvati to obtain the hand of Śiva is designated as Haritalikā ritual. The word आली means a friend. हरिता means brought about. This marriage is brought about by the friend.

The message of this ritual is that the parents should yield to the desire of grown up girls. The girls also should make sufficient efforts to convince parents. In Indian Mythology there are a few instances of love marriage. This is one such instance.

कपिलापष्टीव्रत i.e. Kapila Śhaṣṭi ritual

The worship of Sun and Cow

On the sixth day of Bhādrapada Krishnapakṣa the worship of Sun and the cow is prescribed. For undertaking this ritual, a three level bath is prescribed.

- i) The leaves of देवदारु, उशीर, कुड्मुग, एल etc. be crushed and by the juice produced by it, a bath to be taken.
- ii) A bath by पञ्चगव्य be taken.
- iii) A mudbath collecting the mud from a clean place be taken.

Then, offering prayer to Varuna the water bath be taken in a pond or a well.

- i) तडागे दीर्घिकायां वा गृहेवा नियतात्मवान् ।
देवदारुं तयोर्वीरं कुङ्कुमैलामनःशिलम् ।
पद्मकं पत्रकं षष्टि मधुगव्येन पेषयेत् ।
क्षीरिणालोढ्य कल्केन स्नानं कुर्यात् समन्त्रकम् ।
- ii) पञ्चगव्यकृतस्नानः पञ्चमङ्गैस्तुमार्जयेत् ।
- iii) आनाय मृत्तिकां शुद्धां स्नानार्थं वै प्रयत्नतः
मृत्तिके ब्रह्मपूतासि काश्यपेनाभिमन्त्रिता
पवित्रं कुरु मां नित्यं सर्वपापात् समुद्धर ।

For the worship of Sun a drawing of Sun seated on his chariot drawn by seven horses be prepared on सर्वतोभद्रमण्डल in a lotus of eight petals. At the centre the Sun with thousand rays is drawn. On the eight sides by the eight names आदित्य, दिवाकर, प्रभाकर etc. the presence of Sun be depicted.

After the worship of Sun a cow accompanied by her calf be worshiped. The cow is respected so much in Indian cultural tradition that a प्रदक्षिणा of cow is considered as a प्रदक्षिणा of the entire universe.

गां स्पृष्ट्वा च नमस्कृत्य यो वै कुर्यात् प्रदक्षिणाम् ।
प्रदक्षिणीकृता तेन सप्तद्वीपा वसुन्धरा । (ब्र.रा.)

The Sun and Cow are held to be most sacred objects in Indian Cultural tradition. सूर्यनमस्कार in the early morning was regularly practiced by our fore fathers. The गायत्री prayer to सूर्यनारायण was offered thrice a day. Even rural people offer सूर्यनारायण early morning.

Ganesha Chaturthy Festival

Apart from specific rituals there are some important festivals that are observed by the entire community. Ganesha chaturthy is one such festival. It is observed all over India. Both Śaivas and Vaisnavas observe it. During Ganesha festival programmes, music, dance etc. are organised. The programme of Harikathā and lāvani organised in Maharashtra and North Karnataka are not only entertaining but are instructive. This art is dying. It should be modernised and continued.

Lokamanya Bala Gangadhar Tilak made it a national festival and utilised it for infusing patriotism. It is observed with all pomps in Maharashtra, particularly in Mumbai.

Deepavali Festival

Deepavali is another colourful festival. Naraka Chaturdashi, is observed to commemorate the destroying of Narakāsura who had put sixteen thousand royal girls in the prison. They were released by Sri Krishna on this day. The next day i.e. amāvāsya day is Lakshmi-puja day. Merchants close their accounts on this day and open the account for the next year. They invite their customers for Lakshmi-puja and establish cordial relations with them.

The next day is Bali pratipat. Bali Chakravarti is worshiped on this day. On the second day brother and sisters greet each other. It is more a social festival than religious festival.

Playing dice is an important item in this festival.

Pārvati plays dice with Śiva

In सनत्कुमार संहिता an interesting episode is narrated about the dice play.

Lord Maheśwara himself desired to play the dice with Pārvati. He said the dice serve three purposes.

कालक्षेपाय केषाञ्चित् केषाञ्चित् धनहेतवे ।

केषाञ्चित् धननाशाय पश्य द्यूतं मया कृतम् ।

When he started playing dice with Pārvati he lost the ownership of the three worlds one by one. Then he lost the bull, the Snake, the moon on his head one by one. Ultimately he had to leave Kailāśa. On learning this Skanda approached Pārvati and played dice with her and got back all items won by her from Śiva. However, Śiva did not return to Kailāśa. Ganesha came to know about it. He went to skanda played dice with him and won all the items lost by Pārvati. He persuaded Śiva to return to Kailāśa.

Purāṇik stories are meant to instruct the common people who are quite innocent.

The message of this episode is that games like dice may be initially a nice past time but it will recoil on innocent person if it is made habitual.

So far we noticed some religious rituals and social festivals.

Worship of Āśvattha

There are some rituals associated with the trees and plant. Among these worship of Āśvattha, Bilva and Tulasi are important.

The worship of Āśvattha is particularly helpful to obtain progeny. It also cures a number of diseases. It is stated to be an embodiment of Viṣṇu.

- i) भगवन् सर्वधर्मज्ञ सर्वशास्त्रविशारद ।
नारीणां पुत्रहीनानां नराणां सुखसम्पदाम् ।
उपायं चैव मे ब्रूहि सुखसिद्धिः कथं भवेत् ।
- ii) न दानैः न तपोभिश्च नाध्वरैः भूरिदक्षिणैः
अश्वत्थसेवनादन्यत् कलौ नास्त्यपरा क्रिया ।
- iii) मारीभयं राजभयं तथा चौराग्रिजं भयम् ।
क्षयापस्मारकुष्ठाद्यः प्रमेहो विषमज्वरः
उदरं मूत्रकृच्छ्रं च गृहपीडाश्च
अन्ये चानुक्तरोगा ये व्रणरोगास्तथैव च
एतैषां च विनाशाय कुर्यादश्वत्थसेवनम्
- iv) अहमश्वत्थरूपेण सम्भवामि भूतले ।

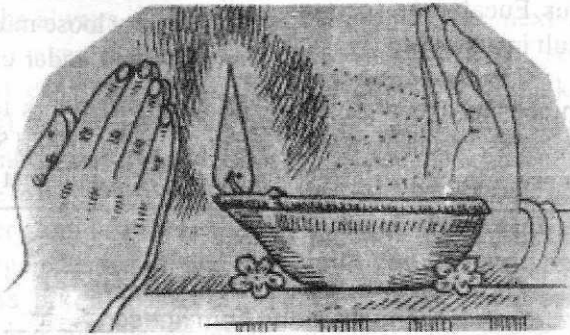
Trees and plants are the embodiments of deities

In the context of worshiping of Āśvattha it is stated that all the trees are the embodiments of the deities. Hence these should be carefully protected and adorned.

- i) मूलतो ब्रह्मरूपाय मध्यतो विष्णुरूपिणे ।
अग्रतः शिवरूपाय अश्वत्थाय नमो नमः ।
- ii) अश्वत्थरूपी भगवान् वटरूपी सदाशिवः ।
पलाशोऽभूत् विधाता च वज्री शक्रो बभूवह ।
इन्द्राणी सा लता जाता देवनार्यो लतास्तथा
मालत्याद्याः पुष्पयुक्ताः ऊर्वश्याद्यप्सरोऽभवन्
तस्मात् सर्वप्रयत्नेन सर्वदाऽश्वत्थमर्चयेत् ।

This deifications should not be taken literally and as a superstition. It is intended to imbibe the deep interest in the preservation and protection of flora.

Each age has its own method of motivating the people to undertake the programme that promotes the individual and social welfare. Indian Myths and rituals follow the method of investing the divine power to the cultural and social activities to motivate the social welfare activities and social fellowship. This has worked well for centuries. A few might question the authenticity of it. But those who question it have not formulated any alternate secular method to motivate the social welfare activity.



ROLE OF TREES AND PLANTS IN THE PURIFICATION OF SOIL

Dr. G.K. Veeresh

Former V.C. and President, APOF

एषा वै भूतानां पृथिवी रसः पृथिव्या आपोऽपामोषधयः

ओषधीनां पुष्पाणि पुष्पाणां फलानि फलानां पुरुषः पुरुषस्य रेतः ॥

(Bruhadarnyakopanishad 4-8-4-1)

Prithvi is the essence of all beings. Ap is the essence of Prithvi, Plants are the essence of Ap, flowers are the essence of plants, fruits are essence of flowers, person is the essence of fruits, retas is the essence of person.

One needs to know the pure and impure soil to understand the influence of trees and plants in the purification of soil. From the viewpoint of agriculture, soil is considered good or bad depending on the fertility status, structure and texture of soil, aeration, porosity Good soil is judged in its productivity and production. Bad soils are those which are unproductive and problematic like saline and alkaline soil, water logged, gravity etc. Trees and plants play great role in rectifying (purifying) problematic soils and enhance the fertility of good soil. Some of the tree species help to manage salt affected soil. Species like *Acacia nilotica*, *Prosopis juliflora*, *Casurina equisetifolia*, *Sesbania egyptica* and various Eucalyptus species give encouraging result in alkali soil.

For stabilization of mined lands, land slides, land slips and denuded lands, mechanical and biological measures are adopted to arrest

soil, water and nutrient losses. Trees and plants are major biological measures. The techniques are known as watershed approach.

Soil becomes polluted, not so much because of pollutants but more because of loss of fertility due to wind, rain, floods, sun, fire, land slides, mining etc., and become unfit for cultivation. During 1930 the Central American people migrated because of loss of soil due to wind typhoon. To make this soil living and productive, trees and plants are the only means in the long run to recover the soil and sustain on a permanent basis. Even the aerable lands under rainfed agriculture, where the fields are exposed to sun, rain and wind for seven to eight months in a year may loose much of the soil fertility if not covered under crop or mulch.

The term soil refers to the upper layer of earth, to a depth of 15 to 30 cms from the surface. It is said that it takes 100 years to

माता भूमिः पुत्रो अहं पृथिव्याः ॥

(अथर्ववेद सं 12.1.12)

Earth is the mother and I am her son.

form 2 to 5 cm soil through natural weathering. From the point of farming the soil consists of four important parts. They are

1. The solid minerals
2. Water
3. Air and
4. Organic matter.

The solid minerals consist of sand, silt and clay particles with oxygen, silicon, aluminium, potassium, calcium and magnesium. The water is soil solution containing dissolved nutrients. Air in the soil aerates the roots with oxygen and helps to remove excess of carbon dioxide from respiring roots. The organic matter influences soil properties. At any given time the organic matter in the soil consists of 3 distinctly different parts, the living organism, fresh residues and decomposed residues. All the four in right proportion and combination make good soil. If there is imbalance it needs rectification.

We can understand the role of trees and plants in building healthy soils through nature's agriculture. The nature's agriculture is summed up best in Howards (1940) statement that "Mother earth under the cover of trees never attempts to farm without live stock; she always raises mixed crops; great pains are taken to preserve the soil and to prevent erosion; the mixed vegetable and animal wastes are converted into humus; there is no waste; the processes of growth and the processes of decay balance one another; ample provision is made to maintain large reserves of fertility; the greatest care is taken to store the rainfall; both plants and animals are left to

protect themselves against pest and disease".

The soil fertility is basically generated in the woods and forests. It is said that to get the full benefit of a tree to the soil fertility it is only after fifty years of its life. For example Eucalyptus plantations cut in 6 to 7 years shows nutrient deficiencies in soil but in hundred year old Eucalyptus plantation, no such deficiencies are noticed.

Litter fall from the trees is the major pathway for the return of many of the macro and micronutrients. The amount of litter formed varies across the forest types. For eg: litter fall is highest in bamboo forests (7415 kg/ha) followed by *Terminalia* (6661 kg/ha), *Dalbergia* (6410 ka/ha) and *Tectona* (4492 kg/ha) forests. In the leaf litter, concentration of nitrogen is highest followed by potassium and phosphorus. Further, the leaf, pod or fruit register higher concentration of nutrients. Phosphorus content is more in reproductive parts of the tree.

The quantity of nutrients returned to soil also vary from species to species. For example the return of nitrogen was maximum in *Dalbergia* forests (93.90 kg/ha) followed by bamboo (92.30 kg/ha) *Terminalia* (60.30 kg/ha) and *Tectona* (54.21kg/ha) forests. Potassium, the next element returned in higher quantity of soil was maximum in *Terminalia* (45.40 ka/ha), followed by bamboo (44.75 kg/ha) and *Tectona* (7.70 kg/ha) Thus the return of nutrients was highest in *Dalbergia* forests while *Tectona* contributed lower quantity of nutrients to the soil. The C:N ratio of leaf litter (the whole leaves) ranged from 6.92 in Subabul to 54.97 in Eucalyptus. The 'P' status was highest for

subabul (0.38%) and lowest for Eucalyptus (0.22%). The lignin content was highest in Eucalyptus with 43.9 percent lignin followed by Acacia 39.2 percent, Silver oak 24.3 percent and Subabul 6.4 percent. Average nutrient content of subabul treated soils was highest on 125th day and lowest in Eucalyptus treated soils. Growing green manure crops in cultivated field is one of the oldest practice to purify the soil and improve the productivity. The green manure crops contribute anywhere between 60-200 kg N/ha in about 45-60 days. Atmosphere has 78 percent nitrogen but not all plants can avail it. Only leguminous plants through their Rhizobial nodules can trap atmospheric nitrogen and fix in the soil for plants to absorb. Similarly Phosphorus in the soil is not easily available except through mychoryzae fungi. Multipurpose Trees like Neem, Pongamia, Mahuva, serve the soils as nutrients, Insecticides, fungicides and purifiers of soils.

The nature's agriculture can be seen under the trees, woods and forests. Mixed farming is the rule; plants and animals (soil fauna) live together. There is no monoculture; mixed crops and mixed farming are the rule. Soil is always protected from the direct action of sun, rain and wind. The sunlight is shared by canopy and of the undergrowth. The leaves break up the rainfall into sprinkle which does not wash away the litter and life in soil. The strongest wind is made into a gentle air current. The rain water moves slowly downwards, passing through humus layer and then into the soil and sub-soil through network of the burrows made by earthworms and other soil fauna.

The pore space of the forest soil is maximum creating a large internal soil surface in which

water is held for sometime, thus making streams and rivers perennial. Therefore there is no drought in forest area and no soil erosion.

The trees manure itself. It makes its own humus and supplies itself with minerals. The fungi and bacteria constantly work in presence of moisture under tree and convert to humus, the food for growing plants. The mineral matter needed by the trees and the undergrowth is obtained from sub-soil. No manure needs to be added, the humus provides the organic manure; the soil provide mineral matter. There is no deficiency of nutrients under the tree cover. Therefore good crops can be grown on recently cleared land without manuring for several years. The Jhum cultivation of North-East India is based on this principle.

Purification applies where pollution occurs. Soil pollutes not so much by adding pollutants but by removing nutrients. The NPK fertilizer is said to pollute the soil because it induces the plant to take up other nutrients from the soil and leave the soil exhausted. This will not happen in the organic manure applied soil. Only a part of the applied fertilizer is utilized by plants, the rest leaches down to water bodies. Pesticides pollute the soil by killing the soil fauna, an essential link in the formation of humus. Vast area of agricultural land become unproductive without humus and no life in the soil. They are dead soils. To rejuvenate such soils, trees and plants are a must. Here, purification means augmenting the soil fertility for productivity and maintaining the same constantly. It is akin to rectifying several ailments due to malnutrition in men by providing nutritional food. It amounts to purifying the sick person. Therefore we

may look at Trees and Plants as basic source of soil fertility and sanity of soil. There is a direct relationship between soil fertility and people's prosperity of that area. A simple comparison of people of North American countries endowed with rich fertile soil and green cover, with that of South East Asian population living on land exploited for several centuries, reveal the role of forests in building healthy soil and healthy people.

Civilizations prospered in delta areas of Nile, Amazon, Volga, Indogangetic plains because of the alluvial soil, rich in humus brought from forest areas of hills and mountains. Earlier people went in search of fertile soil and settled. After the population explosion people had to go to the degraded land and made it productive with the help of live stock manures and leaf mulch.

What the future holds for this country's prosperity? Is it the high rising building on fertile soils, Is it making 6 lane highways cutting down centuries old trees; Creating infrastructure for information technology for fat salaried jobs? Yes all these become necessary if we have enough wealth created. From where this wealth comes from? From outer space? Or by mining earth? For some, for some time, from somewhere, it may be possible. But for everyone of this earth to have some basic needs like food, shelter and clothes, it has to come from the earth's natural resource. We have enough of natural resources for every ones need but not to the greed of

anybody (Gandhiji). Soil fertility is the key to the prosperity of any nation, Trees and plants are the primary producer of this wealth. The famous saying of the poet Wordsworth that "Forest precede man, desert follow him" is now familiar to everyone.

Tree planting has become an annual ritual but where are the trees. In the birth place of Mahatma Gandhi, Gujarat you can walk miles and miles with no trees to see. If one billion people planted one sapling each, every year and saw it to grow to a tree in his life time, perhaps no land would be available for future generation to plant anything. The Government efforts of afforestation is mainly to meet the immediate need of the present generation of fuel, fodder, fibre and timber. It is like growing crops and annually harvesting, the social forest remain for few more years to be cut. It is not going to create perennial wealth.

Everything can wait but not planting trees and to see them growing big. The efforts should be of the types to build national highways, or ONG's exploration of oil on priority basis. The NGO's and Religious Institutions can play a major role in greening the grey areas. Several NGO's, Temple authorities and religious heads arrange hundreds of mass marriages every year. If they undertake from each couple that they plant and raise a tree, so that the growth of their family will be reflected by the growth of the tree.

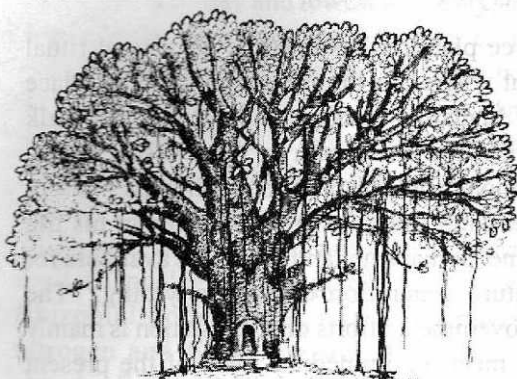
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अश्वत्थमेकं पितुमिन्दमेकम् न्यग्रोधमेकं दश चिञ्चणीकाः
कपित्थबिल्वामलकत्रयं च पञ्चाम्रवापी नरकं न पश्येत् ।

FIVE SACRED TREES

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The title of my paper being "Five sacred Trees", I feel it is necessary to examine the very title itself. The problem I faced at the outset and the satisfactory answer unfounded yet, is with the number 'five'. Neither in our ancient literature on Āyurveda and Dharmaśāstra nor in the modern texts on plants and medicine. I could find the word Pañchapallava and Pāñchakṣīri. Perhaps it became commonplace to speak of Pāñchavṛkṣas due to the popularity of the above materials in rituals and medicine. In identifying the Pāñchavṛkṣas, the rural herbalists and Purohitas do not agree to some length, but when pressed for authentic source they are at a loss and take to tale-telling ! However, in the course of my limited study, the word Pañchavṛkṣa is found in 'The wealth of India' (Raw

“पश्य देवस्य काव्यं यो न ममार
न जीर्यति”

Look at the poetry of God that does not
die or get aged.

Materials, vol iv, p. 23). There it is said : 'The four out of Pañchavṛkṣas belong to Ficus Linn. (Moraceae) group'. Unfortunately, the book does not identify the trees.

Similarly, Dr. K.M. Nadkarni in his book "The India Materia Medica" (P. 552) observes; 'A decoction (or oil?) of the barks of the five varieties of figs (*Ficus religiosa*, *Ficus bengalensis*, *Ficus glomerata*, *Ficus infectoria* and the root bark of the *Neem* form Pañchavalkala or five barks is called Pancha Valkala Kashaya.....'. But, Dr. Nadkarni reads only four fig trees. *Neem*, not being a fig tree may be additional one with five figs. In the शब्दार्थकौस्तुभ by Chakravarti Shrinivasa Gopalacharya, five trees are considered as Kṣīravṛkṣas. They are Āla (*Ficus bengalensis* or *Nyagrodha*), Atti (*Ficus glomerata* or *Udumbara*) Arali (*Ficus*

religiosa or *Aśvatha*), *Hāle* (*Alstonia scholaris* or *saptaparni*) and *Hippe*. That last one, viz, *Hippe* is identified by Kittel as *Bassia latifolia*. The sanskrit name for this tree is *Madhūka* or *Lodhra*. Though this tree has latex (*Ksheera*) it does not come under *Ficus* group. Apte reads *Nyagrodha*, *Udumbara*, *Aśvatha* and *Madhūka* only four - as *Ksheeravr̥kṣas*. In the *charaka samhitā* (XVI 53, p. 566), along with other trees, the names of fig trees are profusely found especially in the *chikitsasthāna*, but nowhere one can trace in the text the names of *Pañchākṣaris*. The word *Pañchākṣari* is found in one place. There it is said :

पञ्चानां क्षीरवृक्षाणां शुद्धा मुष्ट्यंशकामपि ।

The texts on Hindu rituals give the names of *Pañchavalkala*, *Pañchapallava* etc. Thus, in the *प्रयोगपारिजात* it is said :

न्यग्रोधपिप्पलप्लक्षजम्बूततदुद्भवाः ।
पल्लवाः पञ्च विज्ञेयाः त्वक् चैतेषां निधीयते ॥

Similarly, the *शान्तिपुष्टिरङ्गिणी* (p. 30) reads that (following are the materials to be used in *Kalaśasthāpanavidhi* :

अश्वत्थोदुम्बरप्लक्षचूतन्यग्रोधपल्लवाः ।
तेषां त्वचश्च पञ्चैव गृहीयात्सम्भवेषु वै ॥

Kalaśasthāpana is a compulsory ritual to be performed at the beginning of many of the *Pūjas* and *Vratas*. The clusters of five sacred trees are placed on a *Kalaśa* (a pot, preferably of copper, filled with water along with the barks of these trees).

Again in the *Satya Ganapatipūjākathā* it is said that these *Pallavas* are auspicious in all rituals:

अश्वत्थोदुम्बरप्लक्षचूतन्यग्रोधपल्लवान् ।
अस्मिन्कुम्भे प्रक्षिपामि सर्वकर्मसु शोभनान् ॥

Except *प्रयोगपारिजात*, all other texts accept four fig trees, the fifth one being *chūta* or *Mango* tree (*Mangifera indica*). The *सर्वदेवप्रतिष्ठाप्रकाश*, another text on Hindu rituals, also reads *Jambū* (*Blue apple tree* or *Eugenia jambolana*), but gives up *Plakṣa* in the list :

उदुम्बरन्यग्रोधाश्वत्थजम्बाप्रत्वक् ।
सम्भवः कषायपञ्चकं तत्पल्लवाश्च ॥

If a *Kalaśa* was to be preserved for a long time, i.e., if a ritual continues for many days, the water along with the barks of five trees should be boiled, prepared a *Kaṣāya* and then poured in the *Kalaśa* pot.

However, the *द्रव्यगुणविज्ञान*, by, *Priyavrata Sharma*, cites (in vol. I, *औद्भिदगण*, p. 98) two verses, one of which gives the names of *Puñchākṣiri* trees :



न्यग्रोधोदुम्बराश्चत्पारीशप्लक्षपादपाः ।
पञ्चैते क्षीरिणो वृक्षास्तेषां त्वक् पञ्चवल्ललम् ॥

Immediately after this verse the author quotes a verse from the राजनिघण्टु (the authorship of the first verse is unknown) which records the names of Pañchavetasa:

न्यग्रोधोदुम्बराश्चत्प्लक्षवेतसवल्ललैः ।
सर्वैरेकत्र मिलितैः पञ्चवेतसमुच्यते ॥

Further, he comments making the confusion worse confounded :

राजनिघण्टु पारीश के स्थानपर वेतस को पढता है ।
(Ibid, p. 98)

Again, in the Indian Medicinal plants by Kiritikar and Basu (Vol. III, p. 2320) we get a reference of Pañchavalkala. While giving the description of the tree *Ficus acor* (rendered as Basari in kannada) the book says: 'The bark of this (i.e., *Ficus acor*) along with the barks of other four species of *Ficus* and of *Melia azadirachta* (Nimba or the Neem tree) pass by name Panchavalkala'.

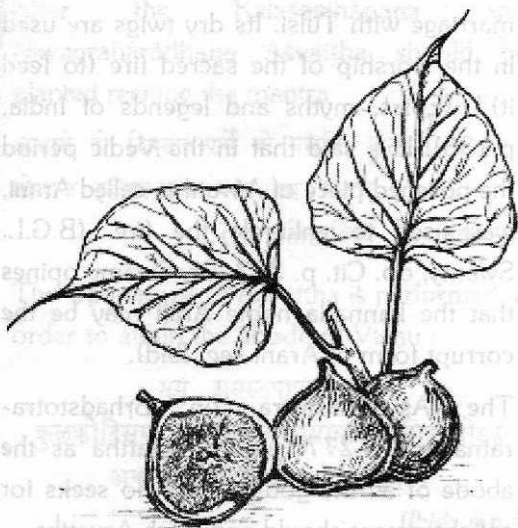
Under these confusive sources, there is no wonder if one is at a loss, as to which reference is to be taken as authentic. However, to bring uniformity in the treatment. Pāriśa could be included. The Materia Medica (p.629) equates Pāriśa with *Thespesia populnea* or *Hibiscus populnea* (gives kandarāla as its kannada name). But this does not belong to *Ficus* group. Dr. G.Ganeshayya, prof. of Botany, Bangalore University has prepared a compact disc

called Sasya Sahyādri, in which he identifies pāriśa as kallarali, the botanical name of which, according to Dr. D.R. Priyadarsanan (studies on the systematics and ecology of fig insects and their hosts, *Ficus* of Kerala p.193) is *Ficus arnottiana*. But K.M. Nadkarni (p.543) gives plakṣa as the Sanskrit name for *Ficus arnottiana*. This tree is also called Beṭṭarali and kādarali (Indian Medicinal Plants, p.2.331). But again to add to our confusion, the द्रव्यगुणविज्ञान (p.677) identifies this tree with *Ficus kumphii*, belonging to family Moraceae, but the Sanskrit name read is very appropriate. That is Aśmantaka (probably it is Aśmāntaka). This tree grows mainly on the edges of Aśman or hilly rocks.

As noted earlier, in order to bring uniformity in the treatment and also to solve the riddle of number 'Five', I have chosen Pañchakṣiris which belong to *Ficus* group only. They are :

1. Aśvattha (*Ficus religiosa*)
2. Nyagrodha (*Ficus bengalensis*)
3. Udumbara (*Ficus glomerata*)
4. Plakṣa (*Ficus infectoria* or *F. tuberculata*)
5. Pāriśa (*Ficus arnottiana*)

Thus, finding an answer, though a feeble one, to the question of five in our title, I shall try to explain the remaining two words, viz., 'Sacred trees' could be explained. Why a tree is regarded with



reverence? Biological, Aesthetic and Religious, these three aspects individually or unitedly generate the feeling of reverence in our approach to plants and trees. A biological description of a tree given by C.H. Waddington (*The Nature of Life*, p.102) may serve well in this context. "Any self sufficient community", he observes, "must contain a basic stratum of organisms which are able to utilise directly the sun's energies to Synthesize complex organic molecules : these are the green Plants". Therefore, there is no wonder, if the trees are regarded sacred, for our needs of food, shelter and clothing are directly or indirectly satisfied by trees only. There is another important aspect that motivated man to regard trees as sacred. That is the medicinal property in trees. Animals, as we observe, by their hereditary mechanism get their physical disorders cured by self medication. Man, when evolved from primitive to

national stage gradually studied the organism of his own self, which was called Āyur² and investigated various medicinal properties hidden in nature. This was developed into a system called the Āyurveda.³ As observed by Joe R. Mansberger⁴ 'the recognition of the multimedicinal properties of certain trees may have led to their sacralization'. Thus, the religious dimension might be considerably a later development. But it may not be singularly utilitarian as aesthetic elements also can be seen in the religious dimension. And even we may go to the extent that the health or utilitarian, religious and aesthetic aspects are inter-related, evolving in a 'Cultural hereditary Mechanism' (term coined by C.H. Waddington, p.113). In this back-ground the details of these five sacred trees are noted below.

1. The Pipal Tree (*Ficus religiosa*) (Kannada-Āsvattha) :

This is a large deciduous tree, epiphytic when young, with spreading branches and pendulous leaves. It has got as many as thirty names in Sanskrit and interestingly most of these names either describe the characteristics of the tree or allude to its mythological episodes. Thus, the names like चल्दल, चैत्यद्रुम, गजभक्षक (कुज्वराशन), गुह्यपुष्प, क्षीरद्रुम, महाद्रुम, शुचिद्रुम, विशाल, वृक्षराज, वैबाध describe one or the other characteristic. The mythological allusions

can be found in the names like अच्युतवास, बोधिद्रुम, देवात्मा, गुरु, केशवालय, कृष्णवास, माङ्गल्य, नागबन्धु, पवित्रक, पिप्पल, सेव्य, श्रीवृक्ष, शुभद, विप्र, याज्ञिक. The original habitat of this tree was the Himalayas and it is said that along with the followers of Buddha this tree entered the southern peninsula. (B.G.L. Swamy, 'Hasiru Honnu' (Kannada), p.362)

According to the Brahma Purāṇa, Aśvattha and Pippala (Curiously the Purāṇa makes a difference between Aśvattha and Pippala), the two brothers, taking the form of trees, were gulping those who come under their shade. The aggrieved sages approached Śanaīśchara (the Saturn) for protection. Śanaīśchara, with the assistance of the power from penance in those sages killed the two brothers. The Padmapurāṇa gives another story : Agni, as per the instructions of gods, entered the private apartment of Śiva and Pārvatī, causing disturbance to their privacy. Agitated by Agni's interference, Pārvatī cursed all the gods to turn into trees and accordingly Viṣṇu took the form of Aśvattha. (Purāṇanāmachūdāmaṇi under Aśvattha). This tree is sacred to the trinity. "In the Shravan Mahatmya", observes P. Thomas, it is ordained that this tree should be worshipped on every Saturday of the month of Shravan (July-August). Saint Vāḷakhilya tells us that Vishnu becomes a peepul. The thread ceremony of this tree is strongly recommended along with its

marriage with Tulsi. Its dry twigs are used in the worship of the sacred fire (to feed it)". (Epics, myths and legends of India, p.135). It is said that in the Vedic period the polished piece of Aśvattha, called Arani, was used to enkindle the fire. (B.G.L. Swamy, op. Cit. p. 362. Dr. Swamy opines that the kannada name Arali may be the corrupt form of Arani see, Ibid).

The Aśvatthastotra (in Brhadstotra-ratnākara, p.277) extols Aśvattha as the abode of all the gods. One who seeks for enlightenment should approach Aśvattha.

तस्मात्सर्वप्रयत्नेह्यश्चत्थं संश्रयेद्बुधः ।

(Ibid verse 5)

The implantation of Aśvattha is regarded as equal to the restoration of one's race :

अश्वत्थं स्थापितं येन तत्कुलं स्थापितं ततः ।

(Ibid., verse 26) If one fells Aśvattha he invites the sin of murdering his own forefathers :

छिन्नो येन वृथाश्वत्थः छेदिताः पितृदेवताः ।

(Verse 30)

According to Brhadśaṁhitā, a source of water will be there where Aśvattha is seen along with Nyagrodha:

वटपिप्पलसमवाये तद्वाच्यं शिरसोदकम् ।

(Verse 96, p.370)

Now, coming to the Aśvatthapratīṣṭhāpana, This ritual is performed in order to protect men and animals from the Sun :

चतुष्पदमार्गे राजमार्गे वा जनपशूनाञ्च आतपवाधा
निवारणार्थम् अश्वत्थप्रतिष्ठापनं करिष्ये ।

After the Kalaśasthāpana and Navagrahārādhanā Aśvattha should be planted reciting the mantra

अश्वत्थे वो निषदनं पर्णे वो वसतिः कृता ।

गोभाज इत्किलासथ यत्सनवथ पूरुषम् ।

(नागप्रतिष्ठाविधि p. 54-55)

The Upanayana of Aśvattha is performed in order to attain the abode of Viṣṇu :

मम समस्तपापक्षयद्वारा

कुलकोटिसमुद्धरणपूर्वकविष्णुसायुज्यप्राप्तिकामोऽहं

अश्वत्थोपनयनाख्यं कर्म करिष्ये ।

(Ibid, p.63)

This is considerably a lengthy ritual and its details are almost the same as in any Upanayanasaṁskāra of Brāhmaṇa and other varṇas. Further, in the Aśvatthavivāha, as prescribed in the Āpasthamba (Ibid, PP. 80-86), the bridegroom is Aśvatthanārāyana in the form of Aśvattha tree and the bride is Mahālakṣmī in the form of Nimba tree :

त्रिमूर्त्यात्मनोऽश्वत्थवृक्षरूपिणे

श्रीमदश्वत्थनारायणस्वरूपाय वराय ...

शक्तित्रयस्वरूपिणीं निम्बवृक्षरूपिणीं

महालक्ष्मीं कन्याम् ...

(P. 81)

The Brāhmakarmasamucchaya prescribes a ritual called Udyāpana and ordains that the ritual should be performed in the eighth, eleventh or twelfth year from planting the tree. It should be performed by the one who has no issues :

ममेहजन्मनि जन्मान्तरे वा

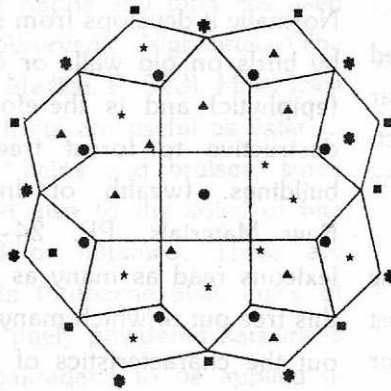
नानानिमित्तोपार्जितसन्तति

प्रतिबन्धकादृष्टनिरसनपूर्वकं सत्पुत्रा-वाप्तये... ।

(Folio No. (पत्रसख्या) 265)

As far as the medicinal qualities of this tree is concerned, the Indian Materia Medica observes : The leaves and young shoots are purgative; fruit is laxative and digestive and the seeds are cooling, laxative, refrigerent and alterative. Fruits dried, powdered and taken

SCHEME FOR PANCHAVALKALA PLANTING



● Arali : *Ficus religiosa*

■ Ala : *Ficus bengalensis*

▲ Atti : *Ficus glomerata*

★ Basari : *Ficus infectoria*

✿ Goni : *Ficus mysorensis*



Mohenjodaro seal showing *Ficus religiosa*

in water for fourteen days removes Asthma and promotes fertility in women. Tender shoots boiled in milk and administered together with a sufficient quantity of sugar added to taste make a very nutritious and cooling morning drink. Milky juice applied is useful in crackled feet and cracked skin. Tender and fresh leaves of *Aśvattha* may be used along with ghee or tailam to cover the inflamed areas and ulcers. *Suśruta* attributes the quality of curing pain in the ears to the oil medicated with leaves. (PP. 552-553).

The discussion on this tree may be closed by the words of prof. A. Bijukumar ('Sacred Groves' in science Reporter, oct. 1998, P. 10), which bring out the multidimensional importance of *Aśvattha*:

"The Pipal tree was sacred for both Aryans and non-Aryans, and is one of the most widely protected in sacred groves ... For religious reasons many people do not even

use the dried parts of the pipal tree as fire wood. It is the Bodhivriksha under the shade of which Gautama became enlightened as the Buddha."

2. The Banyan Tree

(*Ficus bengalensis*) (Kan. Āla)

The very appearance of this tree would influence the onlooker making him to feel that he is standing before a very old man ripened by the experiences of life possessing a long beard !

Banyan is a very large tree with spreading branches attaining at times a height of 100 ft; having numbers of aerial roots some developing into accessory trunks and helping the lateral spread of the tree indefinitely. It is due to this characteristics the Banyan tree is called *Vāta* and *Bahupāda* in sanskrit. The word *Vāta* is derived from वट् - बटति-वेष्टते । see, शब्दार्थ कौस्तुभ under वट्). This tree is found throughout the forest tracks of India. It is ever-green, hard and drought resistant. Normally it develops from seeds dropped by birds on old walls or on other trees (epiphytic) and is therefore considered destructive to forest trees, walls and buildings. (wealth of India, vol. Iv. Raw Materials, PP. 24-25). Sanskrit lexicons read as many as 27 names for this tree out of which many of them bring out the characteristics of this tree. The names are:

अवरोह, बहुपादी, भृंगी, चीर, ध्रुव, जटाल, जटिलजटी, कर्मज, क्षीरी, महाच्छाया, मान, ..., नन्दी, नील, न्यग्रोध, पदरोहण, पतङ्ग, रक्तफल, रोहिण, शिफारुह, शुद्धी (शृङ्गी?) स्कन्धज, वनस्पति, वट, विटपी, वृक्षनाथ ।

The names like वैश्रवणवास, यक्षतरु and यमप्रिय refer to the Mythological importance. (See Indian Medicinal Plants, P. 2314). Apart from these Dr. Nadkarni reads two other names : Shikhandin and Shriksha (P. 543). It should be noted that the word Pañchavaṭī that occurs in the Rāmāyaṇa does not suggest five vaṭa trees. According to Śabdārthakaustubha (P. 1677) the trees denoted by that word are Aśvattha, Bilva, Vaṭa, Dhātrī, and Aśoka.

The medicinal properties of this tree are as follows : The young buds contain tannin, wax, catechu. Fruit contains oil, albuminoids, carbohydrates, fibre and ash. Young buds and milky juice are astringent. Quality of curing dāha (burns), tṛṣṇā (thirst), mūrchā (faint), raktapitta (haemorrhage) Kapha and pitta has been described in Āyurvedic Nighaṇṭus. (The Indian Materia Medica, P. 543). Milky juice and seeds or fruits are useful as external application to pains and bruises, sores and ulcers and also to the soles of feet when cracked or inflamed. These are administered in toothache also. Juice of fruits with the finely powdered karpūra is advised by chakradatta to be applied in

cases of Śukraroga of the eye. Bhāvaprakāśa says that the juice proves good in Arbuda. Internally it is useful in dysentery and diarrhoea. Leaves are heated and applied as a poultice to abscesses and wounds to promote suppuration and discharge of pus. Root fibres in the form of decoction with or without the addition of honey are useful in gonorrhoea. Tender ends of the hanging roots are given for obstinate vomiting. Slender twigs of the tree form a good tooth-brush and its use strengthens gums and teeth. (Ibid, P. 544).

This is one of the trees to be grown near the water resources as suggested by varāhamihira :

ककुभवटाम्रप्लक्षकदम्बैः सनिचुलजम्बूवेतसनीपैः ।

कुरवकतालाशोकमधूकैर्वकुलविमिश्रैश्चावृततीराम् ॥

(बृहत्संहिता)

(This is one of the verses where Varāhamihira prescribes how to construct a pond).

The rituals of this tree are performed by the one who seeks for the abode of Brahma :

ब्रह्मपदप्राप्तिकामः वटस्थापनं तथा अभीष्टदातृत्वसिद्धयर्थं ...

वटसंस्कारं करिष्ये ।

(ब्रह्मकर्मसमुच्चय, P. 270).

It is said that Nārāyaṇa, at the time of Pralaya (deluge of the universe), taking the form of a baby shelters on a Vaṭa leaf. Lilāśuka describes this in an unmatched excellence :

करारविन्देन पदारविन्दं मुखारविन्दे विनिवेशयन्तम् ।
वत्स्य पत्रस्य पुटे शयानं बालं मुकुन्दं मनसा स्मरामि ॥

(कुष्णकर्णामृत , II-58)

P. Thomas, in his 'Epics, myths and legends of India' (P.135) observes : The banyan tree (the Indian fig tree) is sacred to Vishnu. Because of its longevity and nature of dropping roots from the branches, the tree is considered immortal. Narayana sucking his toe (a symbol of eternity) is represented as lying on a Vata (banyan) leaf.

Allusions to this tree is found in different places in the Mahābhārata. Thus, Pāṇḍavas took shelter under this tree when they escaped from the tragedy of lac-Mansion. Hidimbā married Bhīma under this tree. Further, Takṣaka, a dreadly poisonous serpent, while going to kill Parikṣit, who was cursed as to die of a snakebite, bitten this tree to test the power of a sage named Kaśyapa, who was going to rescue Parikṣit. Kaśyapa, by the power of his mantras brought the tree to its original form. (See Purāṇanāma chūḍāmani, p. 241).

There is a well-known Vrata called Vatasāvitṛi performed by women. In this connection p.v. Kane observes (History of Dharmaśāstra, vol.v, part I. p. 93). The worship of Vata tree comes in probably because Satyavrat when the moment of death approached took shelter under the shade of Vata tree and supported himself (by a branch of it and spoke in a choked

voice to Sāvitṛi that he had pain in the head (वटशाखामवष्टभ्य सत्यवान्प्राह गद्गदम् भविष्योत्तरपुराण). The procedure of this Vrata as set out in the Vrakārka (folios 312-320) and other late mediaval works is briefly as follows :

"The woman should make a saṅkalpa in the form 'I shall perform Sāvitṛivrata for securing long life and health to my husband and my sons and for securing freedom from widowhood in this and subsequent lives'. She should then sprinkle water at the root of the Vata tree and surround it with cotton threads and should perform its worship with the Upachāras and then offer worship to Sāvitṛi (with image or mentally) from her feet upwards and pray to her to bestow on her beauty, good name, prosperity and freedom from widowhood. Then she should worship yama and Nārada to give presents (Vāyana) to the priest and break her fast next day".

In this context I would like to make a note on the exchange of names of Aśvattha and Vata that has resulted in many misconceptions. Though the allusions to vata and Aśvattha are frequently found in the vedic and Upaniṣadic texts we are not sure whether it is the same Aśvattha referred to in the present context. However, the modern ecologists seem to identify Aśvattha of the vedic age with the tree what they call *Ficus religiosa*. For instance, J.R. Mansberger writes (In search of the tree spirit, p. 403) :

'The Aśvattha in its epiphytic stage, provided the basis for a vegetative - regenerative image. In this capacity, as being rooted in the life principle (Brahma) the asvattha came to be especially regarded as the life - giving tree and symbol of creation. At the same time, this seemingly undying tree, with its root in the upper world and its branches below, also provided a structurally central image (i.e., symbol of the inverted tree) for the representation of the cosmos'.

Evidently, the above description of Aśvattha go well with Vāṭa or the Banyan tree.

As for as the epiphytic nature in both the trees is concerned, it is more intensely found in the Banyan tree. Therefore Vaibādha, a name found for Aśvattha more appropriately fits for Vāṭa. (Vaibādha means destructive). Another point to be noted is that Pippalāda, son of Dadhichi, was said to have lived with the fruits of Aśvattha but the modern Aśvattha is not sufficiently large to eat when compared to the fruit of Vāṭa. Again, as noted earlier (P.8), one who fells Aśvattha incurs the sin of killing his fore-fathers. This also suggests that the modern Vāṭa was called Aśvattha in olden days. According to astrological books (See, Prāchīna-Pavitrananirmāṇapaddhati - Kannada - p.4) the presiding deity of vāṭa is pitṛ, where as the presiding deity of present day Aśvattha is Bṛhaspati.

The inverted image of the tree that has been a constant symbol for the Saṃsāra holds good with Vāṭa than Aśvattha. (See references of this image in kathopanīṣad vi, 1. ऊर्ध्वमूलोऽवाक्शाख एषोऽश्वत्थः सनातनः । Gītā, XV, 1, and Mankutimmanakagga by D.V. Gundappa, Verse 251). Dr. B.G.L. Swamy, a wellknown botanist, observes in a kannada book titled Sasyapurāṇa. (P.59) as below:

“ऊर्ध्वमूलम् ... ಇಲ್ಲಿ ಅಶ್ವತ್ಥವೆಂಬ ಮರ ನಮಗೆ ಇಂದು ಸಾಮಾನ್ಯವಾಗಿ ಪರಿಚಿತವಾಗಿರುವ ಅಶ್ವತ್ಥವಲ್ಲ ವೆಂಬುದನ್ನು ಸ್ಪಷ್ಟವಾಗಿ ತಿಳಿಸಬೇಕಾಗಿದೆ.”

But, at another place (Hasiru Honnu, p. 360), Dr. Swamy holds the view that the present Aśvattha was described in the Upanīṣads.

In the Bhagavadgītā (Vibhūtiyoga), Lord Kṛṣṇa claims himself to be the best of various groups. Accordingly he says he is Aśvattha among the tree (अश्वत्थः सर्वं वृक्षाणाम् ... ch. x, verse 26). When compared to modern Aśvattha Vāṭa is a mightier, probably the mightiest of all the trees. Therefore, the Aśvattha described here must be Vāṭa only. In addition, the botanical term *Ficus religiosa* might be a misnomer, as this tree originally had no religious importance. The present Aśvattha, as noted earlier, got the religious importance, only after the advent of Buddha. In this way, with all Probability, the present day Vāṭa must be the Aśvattha tree of the Vedic age.

3. The Glomerous fig tree (*Ficus glomerata*) (Kan : Attimara)

This is significantly named in Sanskrit as Udumbara (उत्कृष्टमुम्बरम् । उम्बर means the wooden bean in the lower part of the threshold), Hemodugdghoka (which gives golden latex), Jantuphala (the fruit of which contains lac insects), Yajñāṅga (used to feed the sacred fire) and Dattatreya Vṛkṣa.

This tree is not epiphytic and is found through out India in moist localities. It is also found in rocky slopes, sometimes almost gregariously. It is often cultivated round the villages for its edible fruits. (wealth of India. Vol. Iv, pp. 35-36).

The action and uses of this tree as given in the Materia Medica (pp. 548-550) are as follows : Leaves and unripe fruits are astringent, carminative, stomachic and

vermicide. Leaves and unripe fruits are used in dysentery. In the diarrhoea of the pregnant the fruit with honey is given. Fruit and sap extracted from the trunk of the tree are effective in diabetes. Two ounces of figs boiled in half a pint of water for half an hour and strained forms an excellent gargle for sore throats. In the 'Indian Medicinal Plants' (p. 2327) it is suggested that the root is usefull in hydrophobia. The fruit of this tree is covered round the inflamed nails, especially in whitlow (Prāchinapavitravananirmāṇa Paddhati, p. 14). An interesting myth is found (Pūjāvṛkṣagaḷu - kan - by satyavati Adya, p. 4) in this respect. When Narasimha tore apart Hiranyakaśipu the poison from the chest of the demon entered into the nails of Narasimha. In order to eradicate poison, Lakṣmī suggested him to

NYAGRODHA FRUIT : CONCEPT OF NANOTECHNOLOGY

Conversation between Uddalaka and Swetaketu in Chandogyopanishat (12th Chapter) provides an insight of Nanotechnology. This is the latest technology that deals with materials of a size which is one billionth of a meter. Such materials of atomic and molecular level show special electrical and chemical properties. They are expected to make a significant contribution to the fields of computer storage, semiconductors, biotechnology and medicine. Such infinite attributed material concept, can be seen in,

न्यग्रोधफलमत आहरेति । इदं भगव इति । भिंदीति भिन्नं । भगव इति । किमत्र पश्यसीति अण्व इवेमे धाना भगव इति आसामे कां भिंदीति भिन्ना भगव इति किमत्र पश्यसीति न किञ्चन भगव इति ।

(6-13-1)

Bring the fruit of Nyagraodha (*Ficus bengalensis*) asks uddalaka to swethaketu. When it was brought he asks him to break it. Asks what is inside? Presence of extremely fine seeds – answers. Then the student was asked to take a seed and to break it further. The teacher asks him what he sees inside. Answer is "Nothing at all". If the hidden qualities of all the features of a huge tree could be stored in a small seed, the modern Nanotechnology concept in front of natures is not all that high precision.

cut the fruit of Udumbara into slices by his nails. Thus, Narasimha got his nail cured. According to Śeṣāchalamāhātmya (Ibid, p. 4) the milky juice of Udumbara was applied to the wounds of Śrīnivāsa of Tirupati by his mother Bakulādevī.

The saṁskāras for this tree, I am told, are performed mainly in the Datta cult. (Note that this is called Dattatreya also). In the Viṣṇusahasranāma, Lord Viṣṇu is saluted as उदुम्बराय नमः ।

4. *Ficus infectoria* (Kannada : Basari or Adakalli)

This large spreading tree has as many as 18 names in Sanskrit. They are : अश्वत्थी, चारुदर्शिनी, दृढप्ररोहा, गर्दभाण्ड, जाति, कमण्डलुतरु, कन्दराल, कपीतन, क्षीरी, महाबल, पर्कटी, पिप्परी, पीतन, प्लवक, शृङ्गी, सुपार्श्व कृश्वरोहशाखी. (Indian Medicinal Plants, pp. 2320-2321). But this tree is popularly known as basari. In the Amarakoṣa, the word Plaksha has been used to denote two trees. One is प्लक्षो जटी पर्कटी Lewis Rice gives its botanical name as *Ficus infectoria* or waved leaf fig tree and in kannada it has been translated as Julligida. Again in II, 93 the word Plaksha is used as गर्दभाण्डे कन्दरालकपीतनसुपार्श्वकाः । प्लक्षश्च । Though the botanical name is same, i.e., *infectoria*, kannada name is given as Basari. It seems Amarakoṣa makes difference in these two trees, but I could not trace the tree named Julli. (Kittel calls it Juvvi also).

The 'Indian Medicinal Plants' (p. 2320) names this tree in kannada as Basari,

Basarigoli, Juvvi, Karibasari and Plakṣa and includes under *Ficus lacor*. (P. 2319). 'The wealth of India' (vol. iv, p. 36) recognises this problem and observes that the tree is very variable. Three varieties are found viz: *infectoria*, *lembertiana*, *wightiana*.

This tree is epiphytic in early stages and sometimes sends down a few aerial roots. The leaves are membranous. Nighaṇṭu (according to 'Materia Medica') describes this tree as cooling, Pungent, astringent and curative of Raktadoṣa, Mūrcchā, Śrama and Pralāpa. The bark enters the composition of Pañchavalka. As a vegetable the leaves can be eaten as they are by those who suffer from Raktapitta, (Materia Medica, p. 551). According to Prāchīna-Pavitṛavanānirmāṇapaddhati (p. 4) the presiding deity of this tree is Bhaga and the Nakṣatra is Uttarā. This is said to have the power of bestowing offspring to the childless. (Ibid, p. 8).

As far as the fifth tree is concerned, as already noted, there is a lot of confusion and controversy. Any one of the trees from Chūta, Nimba, Śālmali, Pārīśa, Panasa and Bakula is included in Pañchavṛkṣas. Out of these, Chūta and Nimba are not Kṣīris. And except there is a tradition in Ayurvedic practitioners, more probably an oral one, to include Pārīśa in the group of Pañchavṛkṣas. But, the inclusion of the trees like Chuta, Nimba, etc., mentioned above, I feel that the main reason may be local availability. In the places of west coast, for instance Mango twigs are included in the

Pañchapallava, where as in the southern interior part of Karnataka Mango is replaced by Neem and this religious aspect might have influenced our writers on Ayurveda to record these as different from an older text.

5. *Ficus arnottiana* (San - Pāriśa, Kan - Kallaraḷi)

To include this tree in the group of Pañchakṣīris we have the authority of chakrapāṇidatta, a commentator on Charaka. While explaining a verse (charaka saṁhitā, chikitsā sthāna, xiv, 214) the commentator says:

पञ्चक्षीरिवृक्षाणां न्यग्रोधोदुम्बराश्चत्थपारीशालक्षणां
त्वक् ।
स्राविण्यर्शसि परिषेचने उपयुज्यते ।

This tree closely resembling Aśvattha, is found mainly along the hill-rocks. This is not epiphytic and grows up to the height of 10 to 15 ft. The bark and tender twigs are used to Prepare a decoction, along with other Kṣīris, to bathe after the healing up of small-pox and chicken-pox.

More than their usefulness, I feel our approach should be to love the trees as the living individual beings that have a vital role to play in the preservation of the ecosystem. "The Ficus species", observes A. Bijukumar (sacred Groves, Science Reporter, oct. 98, p.10) "are considered as key-stone resources by ecologists and are believed to play a crucial role in the over - all maintenance of bio-diversity. They provide staple food for birds and

mammals during dry season. "This is due to their continuous fruiting, one tree following the other. This process is due to the life-cycle of Indian lac-insects. This is a reciprocal drama of trees and animals. Though the "Hindu tradition exhorts its followers to protect several species of trees as sacred and to raise groves of sacred trees in the premises of temples. The sacred groves and the other trees are decreasing at an alarming rate. Though punishment was prescribed for the destruction of trees, plants, fruits and even flowers according to their usefulness and sanctity (See History of Dharma-Sastra Vol.III, p.516-528) Yājñavalkya, Manu and Kautilya) and in the modern times by the government, constant attack on Nature is frighteningly continued resulting in the total imbalance of the environment. Our sincere and faithful efforts making the people aware of ecology, would positively assist in the ever-continuing drama of Nature.

References and Footnotes :

1. a) Under अतिसारचिकित्सा : to prepare decoction following trees (barks) are used न्यग्रोधोदुम्बराश्चत्थगुहानापोथ्य वासयेत् - X,105, P.510
- b) under विसर्पचिकित्सा: न्यग्रोधोदुम्बरलक्षवेतसाश्चत्थपल्लवैः। XI,84, P.519
- c) under द्वित्रणीयचिकित्सा : न्यग्रोधोदुम्बराश्चत्थलक्षवेतसवल्ललाः। XIII, 44, P.542
- d) under - " - न्यग्रोधोदुम्बराश्चत्थकदम्बलक्षवेतसाः । XIII,85, p.545
- e) under क्षतक्षीणचिकित्सा: न्यग्रोधोदुम्बराश्चत्थलक्षशालप्रियङ्गुभिः । XVI, 28, p.564

similarly, in the बृहद्वाचस्पत्यम्, Vol. V the following verses are found :

- i) न्यग्रोधोदुम्बराश्चत्थप्लक्षपिपलशालमली ।
क्षीरिवृक्षाश्च पञ्चैषां वल्कलं पञ्चवल्कलम् ॥
 - ii) पञ्चैते क्षीरिणो वृक्षास्तेषां त्वक् पञ्चमं मतम् ।
त्वक्पञ्चमं हितं पाहि व्रणशोथविसर्पजित् ॥
 - iii) न्यग्रोधोदुम्बराश्चत्थप्लक्षवेतसवल्कलैः ।
सर्वैरकत्रसंयुक्तैः पञ्चवल्कलमुच्यते ॥
 - iv) अश्वत्थोदुम्बरप्लक्षचूतन्यग्रोधपल्लवाः ।
पञ्चपल्लवमित्युक्तं सर्वकर्मणि शोभितम् ॥
 - v) The पञ्चपल्लव used in tāntric rituals :
पनसाग्रं तथाश्चत्थं वटं वकुलमेव च ।
पञ्चपल्लवमुक्तं च मुनिभिः तन्त्रवेदिभिः ॥
2. शरीरिन्द्रियसत्त्वात्म संयोगो धारि जीवितम् ।
नित्यगश्चानुगम्यश्च पयैरिष्युरुच्यते ॥
Charakasamhita, li, 41.
 3. हिताहितं सुखं दुःखमायुस्तस्य हिताहितम् ।
मानं च तच्च यत्रोक्तमायुर्वेदः स उच्यते ॥
Ibid., I,i, 40
 4. 'In search of the tree-spirit : Evolution of the sacred tree *Ficus religiosa*' in 'changing tropical forests' p.407.
 5. I am indebted to Dr. N. Ravi, Shantanu Ayurvedic clinic for this valuable information.
 6. Interestingly, the sanskrit word *aśvatthaka* meaning the loan given at the time of fruiting of *Aśvattha*, seems to stand as an antithesis to this observation of ecologists.
 7. M.D. Subhaschandran and J. Donald Hughes, 'The sacred groves of south India' - ecology, traditional communities and religious change' in social compass, Vol.44, No.3, Sept.1997.

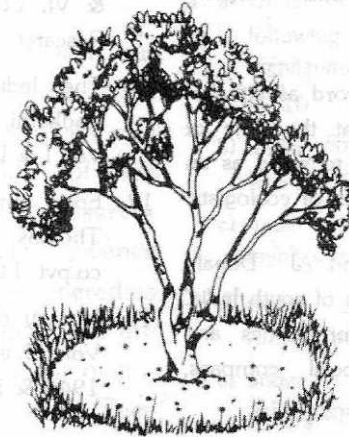
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SACRED TEMPLE TREES OF TAMILNADU (Sthala Virkshas of Tamil Nadu)

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The earliest Tamil poems called Sangam poems could be traced to about first or 2nd cent. B.C. They depict Vedic, Puranic and Aithihasik concepts totally integrated with the Tamil culture. Whatever ideas are noticed about the sanctity of trees and plants found in early Tamil literature are not different from those found in other parts of India.

The Veda speaks of a great tree, that stands encompassing earth and heaven dyava prithvi. This is generally called the axis munri that supports and steadies the universe. This universal tree is the Primordial object of veneration.

We also come across references to a unique tree that has its roots in the sky and the branches and leaves pointing down. It seems that it refers to the sun – Surya, who is rooted in the sky and its rays falling down.

In the Rudram, (Satarudriya hymn), the Sun's rays are called the Satarudras, who reside in the Antariksha, in directions, in the trees and their green branches.

The religious nature of the tree is rooted in Vedic hymns.

In the Chandogya Upanishad we hear the Sun being called the samit, in the supreme homa offered to Brahman. Surya is thus likened to sacrificial twig.

A special wooden post is planted in the centre of the village which is worshipped as the divine by the villagers, according to Tamil literature. Called “Kandudai podiyil” it served as the congregating temple centre in villages. Kandu is Skanda of Sanskrit.

There is also frequent mention of sacred tree called protective tree, “kaval maram” that was held very dear by the villagers. The tree was believed to confer security to the people of the villages and any harm to the tree was wrought with danger to the village inhabitants. When the kings invaded the enemy territory, they used to cut the protective tree as a sign of inflicting defeat on the vanquished.

We also come across mention of the life giving properties of some fruits like Amalaka. The great Chieftain Atiyaman Neduman Anci, got a Amalaka fruit that could bestow immortality. As he was a great patron of poets and learned, he gave it to the famous poetess Avvaiyar, instead of himself benefiting by it. He is praised in several poems for this generous gesture. That illustrates the faith in the medicinal properties of some fruits in the Sangam Age.

When we come to historic age we find a very interesting tradition of building in the midst of vanas. As for example the famous Nataraja temple is located in what is called Tillai vana. Another temple is located in Svetavana.

“Venkadu”, Similarly we have chyutavana, Nimbavana, Veppankadu and others.

The Vastu Sastras prescribe a separate chapter how to select a site for habitation and also temples. It is called Bhupariksha. One of the main criteria is that the site should have trees and plants that are conducive to the health of the people giving good and fragrant air etc. The references to both villages and temples situated in the midst of good trees and plants and creepers illustrates that this vastu principle is followed in Tamilnadu while building temples. Such temples are innumerable in Tamil Nadu. Most temples have one or the other tree considered the sacred tree that goes by the name Sthala Vriksha, the tree of the sacred place.

Some of the most well known temples have such trees.

- * Meenakshi temple of Madurai has Kadamba tree.
- * Jambukesvara temple at Trichy; Jambu tree
- * Ekamresvara temple at Kanchipuram; Mango tree (Amra)
- * Kapalisvara temple at Mylapore; Punnai tree
- * Thiruvaidaimarudur temple at Marudu Arjuna tree
- * Triruvorriyur near Madras; Vakula tree

There are several temples that have vata vrikshas, Asvattha tree, Amalaka, Vanhi tree, Jasmine creepers etc. We may present a long list of such temples but suffice to say that in most cases the temples have a sacred attribute attached with the local legends.

Though the names of the Sthala vrikshas are mentioned in the Sthala puranas, the medicinal properties of these trees or their products are not systematically documented. In most cases the Sthala puranas state that the devotees get cured of their diseases by taking bath in the Tirtha of the temple and worshipping the deity. The Association of Sthala Vriksha with temples are seen mostly in the case of Siva temples and Subrahmanya temples.

In the case of Vishnu temples not much association is recorded. Though in the case of the famous temples like Srirangam, and Kurukur the association of sacred trees are known. For example at Srirangam the Sthala Vriksha is Punnaka and at Thirukkurukur, the birth place of Nammalvar, the tree is tamarind. It would be interesting to collect scientific data on all these temples.

There is one interesting factor that deserves attention in this connection. Temple worship is connected with conservation rites-Kumbhabhisheka and performing yagas for which yagasalas are erected. The offerings in the sacrificial altars require several parts of the trees which include roots, shoots, twigs, leaves, buds, flowers, fruits etc. which are offered in fire. More than 150 varieties of plants, flowers, sprouts, roots etc. are used, many of which are medicinal plants listed in Ayurveda. It is believed that the smoke emanating from the Yagna-kunda are medically helpful to the devotees.

Another important factor that needs to be noted is that most great temples in Tamilnadu had Hospitals attached to them called Atula salai in which both maruttuvas (Physicians) and sastra cikitsai ceyvars (surgeons) were working. The temples also stored medicines



Common view of a Temple in Tamil Nadu



Even to this day the temple with such totem are built in India. One such is seen in Minukinagurki near Chikkaballapur where medicinal grove has been developed. In this grove the lord Subramanya in the form of a hooded snake near a termite nest has been built. Such temples are springing up throughout the length and breadth in various parts of India. The saddest part is that the totem being retained and imitated but the essence of the totemism being lost.

for curing diseases and these were mostly based on Ayurvedic practice.

It is known that we had absolutely scientific treatises, in such text as Susruta samhita, Charaka samhita in which the classification of plants, trees, grains and their essences, rasa and properties are systematically expounded. A knowledge of the medicinal properties of the trees, plants, creepers, roots, flowers were more wide spread in ancient Tamil than it is today.

Another important information known from inscriptions tell us that there were Dhanvantri vaidyasalas attached to temples like Srirangam where kashayas were prepared fresh daily and offered as offerings

to the deity which later was distributed to the patients.

Thus the temples served to cure not only the spiritual ailments of the devotees but also the physical ailments.

With the advent of the colonial rule all the scientific experience and knowledge we had were systematically obliterated with the result we have a tremendous loss of knowledge. There are very few who can properly even identify these plants and trees. Special efforts must be taken to rekindle our knowledge which of course should be on scientific line not on miracles and sky high claims.

○

दशकूपसमा वापी दशवापीसमोद्दः
दशाहदसमः पुत्रो दशपुत्रसमोद्दुमः।

क्रीडारामं तु यः कुर्यादुद्दामफलसंयुतम्
स गच्छेत् शङ्करपुरं वसेत्तत्र युगत्रयम्।

पत्रं पुष्पं फलं मूलं शाखा त्वक् स्कन्ध संज्ञितम्
तुलसीसम्भवं सर्वं पावनं मृत्तिकादिकम्।

नाभ्यामेकं शिरस्येकं कर्णयोस्तु चतुष्टयम्
अन्नोपरि तथा पञ्च भोजनान्ते दलत्रयम्
तुलसीधारणं तीर्थयात्रासमं मतम्।

मूर्त्यभावे पूजनीयो अश्वत्थो वाथ वटोऽथवा
अश्वत्थरूपी विष्णुस्यात् वटरूपी शिवो यतः

बहुभिः वत किं जातैः पुत्रैः धर्मार्थवर्जितैः
वरमेकं पथि तरुः यत्र विश्रमते जनः।

TREES AND PLANTS ASSOCIATED WITH TEMPLES IN KERALA

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वृक्षस्थाः पितरो देवाः प्राणिनां हितकाम्यया ।
वृक्षाणां सेवनं सर्वश्रेष्ठं सर्वमासेषु सर्वदा

(Skandapurāṇa – VI 252-7-8)

[It is for the welfare of all living beings that the Devās and Pitṛs reside in Trees. Worshipping trees always, is the noblest of all things.]

This explains the divinity the Hindus attributed to the trees. The tradition among the Hindus of worshipping the trees and plants can be traced back to the Vedic times. Trees and plants have been attributed spiritual as well as ritualistic significance. Hence a number of trees and plants have close association with Temples.

The Central theme of *Atharvaveda* is the fellowship of man and nature. The *Atharvaveda* emphasizes the importance of trees and plants which provide atmospheric purity, cure a variety of diseases, provide health, rain and water. In short they sustain the very life of all living creatures.

Purāṇās reflect the essence of ancient Indian culture and spirituality, and are considered a storehouse of the thoughts and way of life of the Hindus. They are important sources of the study of the flora and fauna, a very significant aspect of ecology. From the *Purāṇās* we understand that our ancient seers and sages spoke about a close relationship between man and nature.

Our sages believed that trees dedicated their lives to the welfare of man and other living beings. It is well-said in the *Bhaviṣya Purāṇa*:

छायामन्यस्य कुर्वन्ति स्वयं तिष्ठन्ति चातपे ।
फलन्ति च परार्थेषु न स्वार्थेषु महादुमाः ।

(Uttara Parvan, Ch. 128, Sl. 15)

[Trees provide shelter to others while themselves standing under the Sun. Giving up selfishness, they produce fruits for the sake of others.]

Purāṇās have inculcated ecological consciousness in the minds of people. They hold trees to be sacred. Some of the trees and plants are believed to have a divine origin. *Skandapurāṇa* confers divinity to all trees and considers tree-lovers as *Bhāgavatās*. *Aśwattha*, *Pippala* and *Akṣaya-vata* were considered divine from time immemorial. Later *Tulasī*, *Bilva* and *Palāśa* were also added to the list. *Palāśa* is worshipped as *Hari*. *Lakṣmī* stays in *Tulasī*, *Bilva* is considered favourite of *Pārvatī*.

One of the five *yajñas* to be discharge daily by a householder is the *Bhūta yajña* performed by serving trees and animals. The duty of man towards the environment is considered to be on par with his duties to the ṛṣis, gods and other human beings. The unique importance of the trees is described in *Matsyapurāṇa*.

दशकूपसमा वापी दशवापी समो हृदः ।
दशहृदसमः पुत्रो दशपुत्रगमोदृमः ।

[One big well is equal to 10 small wells, one lake is equal to 10 big wells, one son

is equal to 10 lakes, one tree is equal to ten sons.]

Trees and plants play a major role in the Temple customs of Kerala, (as in other parts of India) which are a fusion of the cultural ideas of the early inhabitants as well as those of the Dravidians and the Aryans. The worship of trees, plants, serpent, yakṣas and yakṣīs by the early inhabitants became an integral part of the life of the people. 'Arayāl' or 'Aśvattha', 'Peraal', 'Pāla' (Saptaparnā), 'Māvu' (Cūtaḥ), 'Theṅgu' (Nārikelaḥ), 'Plāśa' (Palāśah) 'Koovalam (Bilva), 'Tulasi, (Sacred Basil) are some of the important trees and plants associated with the temples of Kerala. The chosen flowers used for all deities in temples in Kerala are 'Chetthi', 'Aśoka', 'Tāmara' (lotus – red and white), 'Chamatha pūvu', 'Mandāram' and 'Arali' (Karaviram type).

Religious and spiritual significance of the most important trees are as follows –

Aśvattha – Ficus religiosa, Pippala, The Sacred fig or Peepal tree.

According to *Skandapurāṇa*, Aśvattha is the most sacred of all the trees. It is attended with all auspiciousness. It accords salvation. If mentioned upon and grown during Caturmāsa it is destructive of sins. It is believed that Viṣṇu is always present at its root.

The tree is usually seen outside the temple – standing as the sentinel to the Temple God. A permanent platform is constructed around it for the convenience of performing rites and rituals on it. The structures of the leaves and stalks of the Aśwattha tree are such that it is the tree that emits the maximum amount of oxygen. Besides, it is capable of creating a small amount of ozone too. Ozone helps purifying the air under the tree and destroys the bacteria in the lungs. And this is the secret of the meetings being held under the

Aśwattha tree. A circumambulation (Pradakṣiṇā), of the Aśwattha enables one to attain the qualities of Pañcāmṛta:

1. Serves the Vṛkṣadevata.
2. Quiet exercise
3. The body gets air and light
4. We receive a lot of oxygen from the tree
5. We also get the shade of the tree.

Planting Aśwattha not only destroys all sins but also gives liberation.

Palāśa Tree – Butea frondosa

Palāśa Tree is considered Brahma Vṛkṣa. The tree is served in the form of Hari by persons conversant with ancient lore. Worship of the Brahma Vṛkṣa (i.e., Palāśa) should be carried out with many types of services. It is mentioned as the bestower of all desires, and destructive of great sins.

There are three leaves in the Palāśa (bunch or twig). The middle one is adjured by Viṣṇu. On the left side is Brahma and on the right is Hara. This has been proclaimed (by ancient seers).

The Palāśa tree bearing beautiful red blossoms is found all over Kerala. Its wood is used for making vessels for Yajña (Srutā sūtra). The Daṇḍa held by Brahmin boys during Upanayana is cut off from Palāśa.

Tulasī- Ocimum sanctum or Holy Basil

Tulasi is one of the most sacred plants, a holy shrub grown all over the country and worshipped by all Hindus. Every Hindu house in Kerala has a 'Tulasitara' – brick platform as an abode of Tulasī. Tulasī is dear to Viṣṇu. References to this holy plant are seen in *Devībhāgavata*.

Tulasī stands for purity and sanctity, sought as a purifier of the universe. The Tulasī

leaves are essential for the daily worship of Viṣṇu. It is believed that poverty would never enter the house of one who plants a sapling of Tulasī. The house in which there is grove of Tulasī plants becomes a sacred place. Tulasī leaves are essential in any puja in the Temples of Kerala.

Dhātrī- *Phyllanthus niruri*;

Bhūamyāmalakī.

The great tree of amalakī is believed to be destructive of all sins. According to puranas Viṣṇu is stationed at its root, Brahma is stationed above, and Lord Rudra Parameśvara is stationed on its trunk. If any one performs the worship of Hari in the forest of Dhātrī and takes food under the shade there of in the month of Kārtika, his sin perishes.

Aśoka Tree – *Saraca indica*

Aśoka tree is worshipped by the devotees seeking grace. There are two varieties of Aśoka flowers – the white and the red. The white ones are very fruitful in Tantric rituals whereas the red ones are love-inspiring. Kamadeva chose Aśoka as one of his five flower arrows.

Bilva-vṛkṣa – *Aegle marmelos*

Bilva-vṛkṣa or the Bel has been worshipped and associated with temples since prehistorical times. It has a mythological significance. The leaves are divided into 3 leaflets. The tree is generally grown in Siva temples. It continues to be a holy tree with Śivā's presence in it.

Darbhā - Kuśa grass, *Saccharum*

Æclindorium

Darbhā is highly beneficial. Without Darbhā no auspicious rite can become complete. It is the most sacred of all sacred things and

the most auspicious of all auspicious things. It is a great plant standing on the earth. It has the form of salvation in the case of those about to die. It is believed that Brahma, Viṣṇu and Śiva always stay therein. They stay at the root, the centre and on the top. No ritual in the temples or household can be performed without its use. "Pavitraṁ Vai Darbhā".

Gingelly

Gingelly seeds are unparalleled in sacredness. They facilitate the achievement of piety and wealth. They give salvation too. They dispel sins. Gingelly seeds are destructive of enemies. Seeing the Gingelly seeds is meritorious. In the temples of Kerala Gingelly is used in religious rites like homas etc.

Malaya Vṛksha – Sandal tree, *Santalum album* (Chandana)

It is believed that Gandharvās occupy Malaya tree. The sandal tree is considered a symbol of prosperity and purity. The sandal wood, well-known as a royal tree, has close association with the Kerala temples. It is used, in the form of a paste, as a religious mark on the forehead of the devotee. On occasions the images in the temple are besmeared with sandal paste. The wood is used also for making images of deities.

Cūta-vṛkṣa (Mango tree) – *Mangifera indica* Āmra or Mango

The leaves of the Mango tree are used in all auspicious occasions in the temples. They are used for making festoons to decorate doors, they are used to adorn the Kalasas (vessels) used in religious ceremonies. It is with a mango leaf that a priest sprinkles water (punyavachanam), for purifying the space where the religious rites are performed.

Caṁpaka Flowers

It is said in *Padmapurāṇa* that the fruit which is obtained by giving gold in weight to Meru, was obtained by worshipping Viṣṇu with only one Caṁpaka flower... Caṁpaka flower is always dear to Viṣṇu. Especially in the month of Māgha it is pure and dear to Viṣṇu. Caṁpaka flower is used in all Viṣṇu temples in Kerala.

Flowers used for Pūjās in Kerala Temples:

Viṣṇupūjā

Kṛṣṇatulasī (Kṛṣṇatulasī), Rāmatulasī (Rāmatulasī), Sitāmbujam (Vellatāmara), Raktābjam (Centāmara), Palāśa (Plās), Jāti (Piccakam), Sevantikā (Jamanti), Kunda (Mulla), Japākusumam (Ceṁbaratti), Mallikā (Mallikā), Caṁpakam (Caṁpakam), Bilvam (Kūvalam), Nilotpalam (Nīlatāmara), Kamalam (Tāmara), Pārijātam (Pārijātam), Jambuchadam (Nāvalpūvu), Kalpāram (Kalpāram), Karavaram (Karavīram), Kuśah (Darbhā).

Sivapūjā

Śvetārkaṁ (Erukkin pūvu), Karavīram (Karavīram), Kamalam (Tāmara), Raktamandāram (Cuvannamandaram), Sitāmbujam (Vellatāmara), Tulasī (Tulasī), Aśokaṁ (Aśokaṁ), Caṁpakam (Caṁpakam), Bakulam (Ila i), Mālatī (Pichakam), Palāśam (Palāśam), Darbhā (Darbhā), Sevantikā (Jamanti), Nilotpalam (Nīlatāmara), Bilvam (Kūvalam), Karnikāram (Konna).

Śākteya Pūjā (Devī)

Arnbhojam (Vellatāmara), Utpalam (Cuvannatāmara), Nilotpalam (Kariṅkūvala pūvu), Jāti (Piccakam), Kundaṁ (Mulla), Bilvam (Kūvalam), Aśokaṁ (Aśokaṁ), Mandāram (Mandāram), Durvā (Karuka), Ketakī (Kaita).

Navagraha Puja

Deva	- Puṣpaṁ
Sūrya	- Bilvam (Kūvalam)
Candra	- Siāmbhujam (Vellatāmara)
Kuja	- Raktakusumāni (Raktapuṣpaṅgal)
Budha	- Tulasī (Tulasī)
Guru/Bṛhaspati	- Caṁpakam (Caṁpakam)
Śukra	- Kunda (Mulla)
Śani	- Nilotpalam (Nīlatāmara)

Serpent worship and trees and plants

A study of serpent worship – varied forms of rites and rituals – accords a rethinking of ourselves in the larger scheme of things – of ecology, ethos and existence. Nāgārādhana is one of the most common forms of worship in Kerala, as in some other parts of India. It is believed that the equatorial forests of Kerala housed serpents in so large a number that it was considered the Nagāloka.

Serpent worship can claim kinship with other earlier forms of worship such as tree-worship, fire-worship etc. 'Nurum palum' offering to Nāga deity – a paste made of ingredients such as milk, rice flower, turmeric powder and arecanut flower bunches is reckoned as a special offering for Naga. Though there are myths and legends around the fostering of serpent groves, there may be other reasons – politics, for instance, for this. Even before ecology developed as a branch of science, human sagacity might have already found out a way of keeping ecological balance. The noblest of Vedic thoughts – "Vasudhaiva Kutumbakam" that envisages the whole world as a single family and stresses the relevance of all life forms and the needs for co-existence, must have garnered such needs. This philosophy endorses the right of the meanest creature to live side-by-side with man. ○

AWARENESS OF BIODIVERSITY IN ANCIENT INDIA

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First evidence of human occupation in India dates back to 700,000 – 125,000 years ago. Some 20,000 – 10,000 years ago human population has spread the entire subcontinent, at low densities. Agriculture began some 10,000 years ago and it is less than 4000 years when agricultural settlements covered the Indian subcontinent (Gadgil and Guha, 1992). It is around this time that the Vedic culture was settled in India. Indian population was well evolved and civilized in the vedic period

Knowledge of biodiversity to man is very ancient and is as old as himself. Vedic texts are replete with the usefulness of various kinds of plants for purposes of rituals, food, medicine, fibres etc (Sensarma, 1991). Systematic use of herbs will be found in Rig Veda oushadhi sukta and Atharvaveda. This could be the earliest documentation of the use of plants.

Awareness of biodiversity in ancient India can be deciphered by examining the following:

- (i) Ancient Vedic literature
- (ii) Plant uses in the systems of Medicine like Ayurveda, Unani, Siddha etc.
- (iii) The indigenous, ethnic use of plants for various purposes and the local health traditions prevalent
- (iv) The sacred groves and the culture associated with it.

What is Biodiversity?

Biodiversity is the variety and variability among living organisms and the ecological complexes in which they occur. It can be understood as the species diversity, the genetic variability within a species and also habitat diversity.

Broadly plants can be grouped into Cryptogams and Phanerogams. Cryptogams include algae, Fungi, Bryophytes and Pteridophytes.

Phanerogams are the Gymnosperms & Angiosperms. The subject of awareness of biodiversity can be viewed from two angles:

- a. Knowledge of plants which are useful or otherwise in various ways
- b. Methods adapted to conserve individual plant species or an ecosystem or a landscape as a whole.

Varied kinds of plants are being used in vedic rituals and reference to plants are available also in Puranas. A variety of natural objects are regarded sacred by the Hindu community. Rivers like Ganga, Yamuna, Godavari, Sarayu etc, Mountain peaks like Nanda Devi, Haryali Devi and Kailash in UP, Amarnath in J & K; lakes like Nani and Saharsathal in UP, Renuka & Chandratal in HP; ocean/coastal areas: Puri in Orissa, Dwarka in Gujarath, Rameshwaram in TN. These cover a range

of unique habitats. These, if protected well, can be good examples of *in situ* conservation. Many plants & animals also are considered sacred often associated with different deities and so the protection of such plants become imperative. Even weedy and poisonous species like *Datura stramonium* and *Calotropis procera* are considered sacred whose consumptive values are not known. This can ensure conservation of species which may have potential uses in future.

Sensarma (1992) has attempted to decipher ethnobotanical information from Linga Purana. This has reference of plants in garment making, equipments of various kinds, decoration, fragrance, religious rites etc geographical areas were named after, probably dominant tree species eg: Jambu dvipa-geographical concept of India

Salmalidvipa – Mesopotamia/ Abyssinia from Salmali

Puskkaradvipa – a portion of central Asia

Certain prohibitions were also mentioned viz. not to shelter under Arka, Bibhitaka, Karanja, Snuhi and not to touch the pollen or husks (Probably would cause allergy or discomfort). Linga Purana refers to about 82 plant materials of 36 angiospermic families. However according to Sensarma puranas contain little information about cryptogams.

Plants in Ayurveda :

Ayurveda system makes use of 1773 plant species. This is a well established system with a deep insight into the pharmacological action of plants and physiology of human beings. About 1613 species spread over 829 genera have been correlated to botanical

names by Abdul Kareem (1997). According to Susruta the foremost aim of this system is to maintain health and treating disease is only secondary.

In Ayurveda the pharmacological action is referred to as Guna and seers have recognized 20 Gunas eg: Guru-heavy, Laghu-light, Mrdu-soft, Katina-hard etc.

Virya is another fundamental concept. All things are broadly classified into two categories : Usna-virya (heating) and Sita-virya (cooling)- depending on the subtle influence of sun and moon on them.

Virya vipaka-is transforming the virya of the substance i.e. usna into sheeta virya & vice versa by various samskaras.

Samskara-vipaka in transforming the properties of plant materials by subjecting to different processes or can be targeted to a specific site/ organ (Sivarajan & Indira Balachandran, 1994.)

Eg: Papaya-basically of usna-virya when taken with lime juice becomes samavirya. Guggulu – the gummy secretion of *Commiphora mukul* when purified with gokshura (*Tribulus terrestris*) acts on kidney and urinary tract and if it is purified with kancanara (*Bauhinia tomentosa*) acts on glands and glandular diseases.

Another extraordinary property recognized by Ayurveda in plants in Prabhava (Characteristic) i.e. drugs collected from plants during full moon, new moon or on particular constellations possess certain curative properties not found during other times. Eg: Latex of *Alstonia scholaris* (Saptaparni) is taken with some other ingredients on the day of Karkataka Amavasye.

The most challenging task in Ayurveda is the correct identification of the plants. Traditionally this was passed on from generation to generation. Ancient sages have suggested that they (plants) have to be known with the help of hermits, shepherds and tribals. Unfortunately the population of all this category are dwindling.

Use of the right herb is the foundation on which rests the survival and credibility of the system. Commercial scale productions have lead to a lot of adulteration.

Even the most authentic Ayurvedic text books are not of much use in deciphering the corrent identity of the genuine herb. They give only names and not the details of characters required to arrive at correct botanical identity. Instead, a species may have more than one name and a species can have anything between 1-70 sanskrit synonyms.

Plants with similar pharmacological properties have been used in different regions but traditionally referred to by the same Sanskrit name.

Eg. Pashanabedha – means that which breaks up stones. About 12 different botanical correlations are made by different authors (Abdul Kareen 1997).

Another reason for the lack of one-one correlation in the identity may be that the original plant may no longer be available or may be endemic and the physicians proposed legitimate substitutes with similar bioactivity. Eg: Brahmi In N.India correlated with *Centella asiatica* ; In S. India with *Bacopa monniera*

Folk/Tribal medicine

This is the subject of ethnobotany. India has a multiethnic group of ancient lineage. This

is the richest country in ethnobotanical knowledge. There are 50 million tribals in India belonging to about 550 tribal communities. These tribal communities make use of over 6000 plant species (Bulletin FRLHT,1991). Apart from the tribals there are local Vaidyas, families practicing traditional medicines often with specializations treating only particular ailments like herpes infertility, jaundice etc. This is a very rich treasure house of information on medicinal plants and other plant uses.

For examples various tribal groups of Arunachal Pradesh use:

- 31 plant species for infertility
- 10 related to conception
- 74 for abortion
- 19 for accelerating complaints
- 31 for pre and postnatal complaints
- 9 against miscarriage.

Apart from medicinal use, plants are used for musical instruments, rough Cordge mats, baskets, home building, fodder, dyes, Cigar making etc. insecticides, detergents, country liquor & fermentation, cleaning hair etc.

Madhyapradesh has the highest concentration of tribals among all the states in India. In this state tribals like Baiga, Bhil, Bhilda, Gond, Korka & Muria are using lichens like. *Meteroderma tremulous*, *Parmelia cirrhata*, *P.reticulate*, *P.tenctorum* (Brijlal et.al 1985). Manilal (1981) has reported 26 primitive varieties of rice used by 14 different groups of tribals in Malabar, many of them with medicinal value.

Arogya paccha (*Trichopus zeylanicus*) is used by Kani tribals of Agasthiyar hills in Kerala to overcome fatigue.

Amrita pala (*Janakia aryapatra*), a rare endemic species restricted to Agasthiar hills is being used by Kani tribals for peptic ulcer, cancer and as a rejuvenating tonic. On comparison with Ayurvedic literature they found that this could be the divine drug Mritha Sanjeevini, Sanjeevine, Thampara rasayani referred to in the Oushadha nighantu (Pushpagadan & Rajshekharan, 1990).

Sacred groves :

This is equivalent to ecosystem level conservation or *in situ* conservation which is one of the best methods of conservation. These are patches of relics virgin forests primarily devoted to Serpent God or other deities. Ecologically these function as buffer against perturbation. These can range in size to a small patch to as many as 240 hectares.

These often contain valuable key stone species performing key functions in the ecosystem contributing to support/ enhance biodiversity (Ramakrishnan, 1998).

Eg: Nepalese alder (*Alnus nepalensis*) an early successional tree species in the shifting agriculture fallow plots in north east India is said to conserve nitrogen in the ecosystem. This is protected by local communities who practice Jhum cultivation by slashing a burning.

Mawsmi-sacred grove forest of Chirrapunj area in the North East is a good example of understanding the role of soil fertility and nutrient recycling in the maintenance of

ecosystem equilibrium. This mineral soil which ensures tight nutrient recycling in this fragile humid forest ecosystem. Once disturbed, this degrades into extensively dessertified grassland.

From a sacred grove in Southern Kerala *Kunstleria kerallensis*, a climbing legume was a new genus recorded and a new species altogether (Mohanand & Nair, 1981).

Blepharistemma membranifolia and *Syzygium travancoricum* are rare species found only in sacred groves (Nair & Mohanan, 1981) *Cinamomum quilonensis* a rare species of Cinnamon was discovered in some Kavus of Alapuzha district of Kerala (Unnikrishna, 1995). *Myristica fatua* var *magnifica* which grows in Myristica swamps is found in Kattlekan in Uttar Kannada in a sacred grove and in the travancore forests of Southern Western Ghats. Gadgil & Vartak (1975, 1976) found a sacred grove in the Kolaba district of Maharastra harboring a solitary species of the liana *Entada phaseoloides*. People from around 40 km radius come to collect its bark to treat cattle bitten by snakes. All these only reinforces the significance of sacred groves in conservation.

In semiarid/arid Rajasthan are integral components of sacred groves so that they can never be tampered by individuals.

Around every Bishnoi Temple (Sathri) in Rajasthan there is a sacred grove called Oran which is managed by the village committee. It is mainly of Khejari tree (*Prosopis cineraria*) a leguminous tree. It is a key stone species in the desert ecosystem. Its root penetrates upto 40 m and remains evergreen. Apart from the pod, the bark ground and mixed with flour serves

as a food during scarcity and famine. It is taken care of right from the seedling stage. This tree is very important for their survival in the desert. Survival of Black buck (*Antelope cervicapra*) is only due to the efforts of Bishnois.

They also protect a migratory bird *Demoiselle* crane – a bird of grassland in Eurasia which breeds in the dry lands of Rajasthan. (Jha et al; 1998).

Bishnoi community is a very good example of a community deeply attached to nature and living in harmony with it.

However, other than these extreme examples, sacred groves are now being reduced to mere small concrete structures to house and worship the presiding deity with scant regard for the noble cause of protection of ecosystems that our ancestors had.

Ancient India had a thorough knowledge of biodiversity and its conservation. Use of plants in rituals, references of plants in ancient Vedic literature, a deep understanding and utilization of plants in our various medicine, be it organized systems like Ayurveda, Siddha etc or the folk medicine. It is our obligatory duty to protect, preserve and nurture these ancient practices

for a better tomorrow and welfare of the humanity at large.

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निकामे निकामे नः पर्जन्यो वर्षतु फलवतयो

न ओषधयः पच्यन्ताम् योगक्षेमो नः कल्पताम् ॥

(यजुर्वेद संहिता 33-33)

Let there be timely rain, let there be thick vegetation.

Let everybody be happy & healthy.

VEDIC CONSTRUCTION OF THE POSITION OF NAVAGRAHAS



Ketu:
Dharba *Desmostachya bipinnata*
F : Graminae



Guru
Arali *Ficus religiosa*
F : Moraceae



Budha
Uttarani *Achyranthus aspera*
F : Amaranthaceae



Shani
Shami/Banni *Acacia ferruginea*
F : mimosae



Surya
Arca/Ekka *Calotropis procera*
F : Asclepidiaceae



Sukra
Atti *Ficus glomerata/racemosa*
F : Moraceae



Rahu
Garike *Cynodon dactylon*
F : Graminae

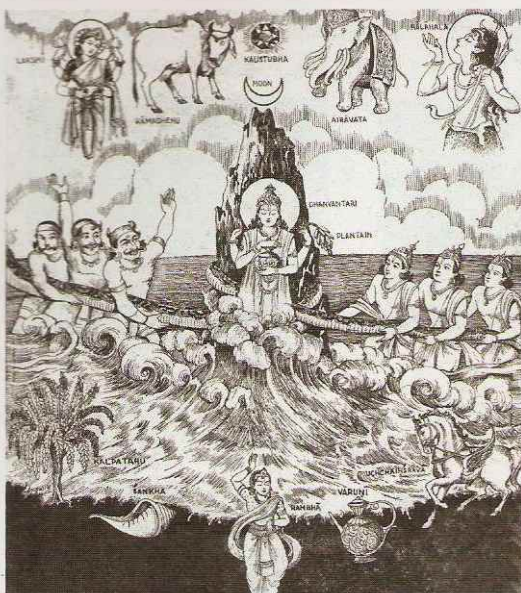


Kuja
Kaggali *Acacia catechu*
F : mimosae

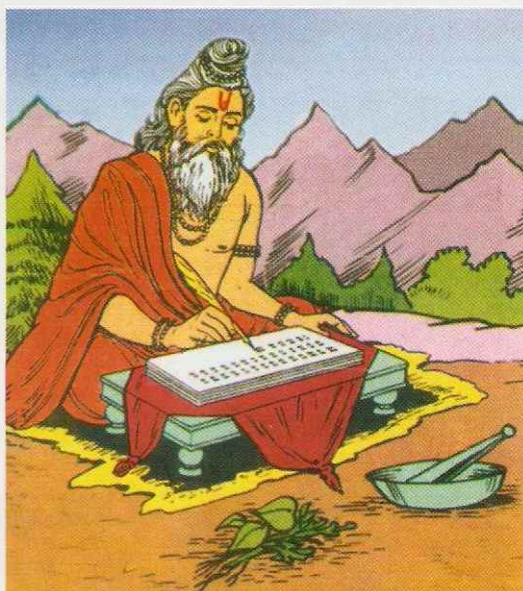


Chandra
Palasa *Butea monosperma*
F : Papilionaceae

Where the Navagrahas are established in accordance with rules found in the vedic manuscripts. Surya is at the centre. Sukra to his east. Sani at the west. Kuja and Guru occupy the Southern and Northern points Chandra and Rahu are placed diagonally at the south east and south western corners. At the other diagonal, at the corners of the North east and North west, Budha and Kethu are placed respectively.



The legend of Samudra Mathana. The Lord Vishnu in the form of Dhanvantari as the Physician with Amritha along with 14 items emerging out of the Sea.



Science of Ayurveda



Herbs were one of the primary sources for medicine during the Renaissance. 16th century painting showing outdoor pharmacy where plants are collected, compounded into herbal concoctions.

Source : National Library of Medicine, Bethesda, Maryland

CODE OF ECO-ETHICS

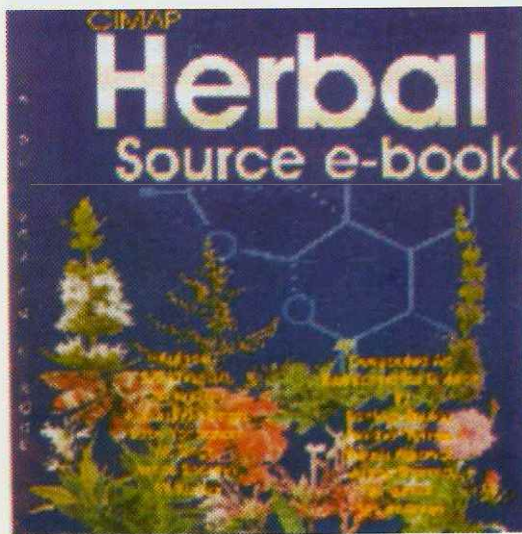
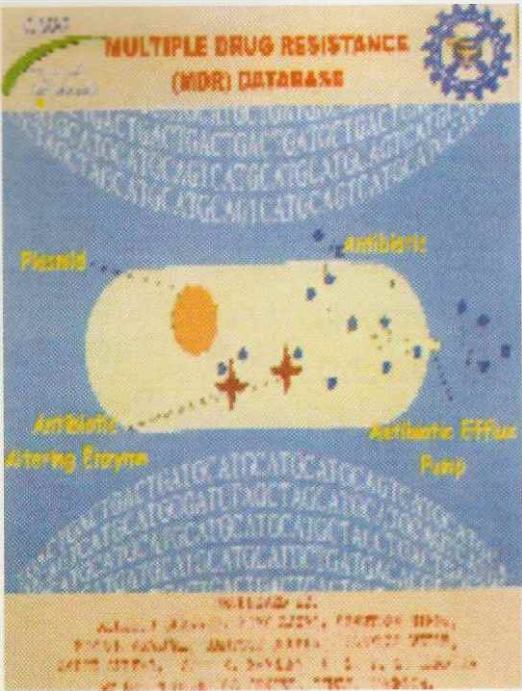


Community in Rajasthan have a great reverence for plants & animals. In the 5th Century they had already developed a religiously dominated “Code of Eco-ethics” in their hazardous environment. The religious leader Jambheswar laid the foundation for this community. In 1485, at the age of 34, he started Bishnoi Samaj, which attracted not only from all castes of Hindus but also from Muslims. Many of their settlements lie near nature reserves. They had shown a bold Socio-political resistance to the rulers of those days. According to the legend in the year 1661 nearly 336 Bishnoi from 84 villages sacrificed their lives in the battle to defend the trees, specially the Khejri (Shami – *Prosopis cineraria*)

Source :Old Painting from Rajasthan

REACH OUT MODE : BIOINFORMATICS

Central Institute of Medicinal and Aromatic Plants (CIMAP) in Luknow, U.P. India has started publishing Journal of Medicinal and Aromatic Plants Sciences (JMAPS)



from the year 2004. The publication intends to bring out the uses of the drugs specially used in Indian systems of medicine. The traditional uses of drug along with other pertinent information like history, medicinal properties as described in ayurveda, unani, Folklore and tribal medicine. This may be a very encouraging step for documentation of scattered and so far neglected scientific facts.

The centre also has undertaken multiple drug resistance database programmes and has brought out CDs and Herbal source e-book for the easy access of the information.

Medical Rituals in Atharvaveda

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Atharvaveda is one of the important vedas. It has 731 Sūktas covered in twenty Kāṇḍas. They consist of many prayers in which the seers have requested to bestow pleasure, treasure and health. They deal with physical world and worldly life. The atharvan mantras are used in different ritual with different purposes. The mantras are classified as पौष्टिकानि, आभिचारकाणि, प्रायश्चित्तानि, स्त्रीकर्माणि, सौमनस्यानि, भैषज्यानि and so on. The classification is based on the subject matter of the sūkta.

Health is one of the important needs of man. Man needs good health not only to enjoy the worldly pleasures but also to lead a happy life. Hence he takes care of his health by avoiding the diseases. He knows that the diseases make a man weak and the weakness cuts short the life-span of the man. Hence the seer of Av was praying for long, happy and healthy life. At the same time he was taking care of his health by avoiding by curing and by preventing the diseases. All such prayers are called भैषज्यानि. The term भैषज्य is related with the word भेषज which means medicine. These sūktas are employed in the rituals by atharvan seers. And every ritual consists of some rites (Karma). Hence the medicine, the mantra and Karman are the essential constituents of भैषज्य i.e., medical practice.

Ayurveda considers that a man suffers from a disease on account of tridoṣa i.e. वात, पित्त ana कफ. But atharvan seer opines that a man suffers from a disease due to food and sin. According to him āyurveda will cure those diseases which are related with food. The atharvan rituals will help to ward off the diseases which are the results of sinful deeds. Sāyaṇa in his commentary on AV opines that the sin done in the previous birth takes the form of disease and that disease will be cured by pacifications, medicines, charity, japa, homa and worships.

जन्मान्तरकृतं पापं व्याधिरूपेण जायते ।

तच्छान्तिरौषधैर्दानैः जपहोमार्चनादिभिः ॥

(Vol. I.P.67)

The sūktas have magical element. The seer while chanting the mantras engages himself in one or other activity. And he uses many herbs, plants, trees, fruits and so on as medicines. The atharvan seer was knowing the medicinal qualities of various plants, herbs and trees. He was aware of that every plant has some medicinal value.

अमंत्रमक्षरं नास्ति नास्तिमूलनौषधम् ।

अयोग्यः पुरुषो नास्ति योजकस्तत्र दुर्लभः ॥

सु.र.भां.

He was using it to cure the disease with the help of spells. There are some important plants and they are as follows :

i) आसुरी :

This is a medicinal herb and it is used to treat leprosy. This herb is dark in colour (श्यामा) and makes the skin of uniform colour (सरूपंकरणी). Karamblekar identifies this herb with रजनी or हरिद्रा according to the hymn I-23 आसुरी, भृंगराज and असिक्री herbs are helpful to cure leprosy. The hymn refers to two types of leprosy i.e. किलास and पलित. किलास is श्वेतकुष्ठ and पलित is grey hair. Sāyana instructs that one should grind भृंगराज, हरिद्रा, असिक्री herbs and mix it with cowdung. That paste should be applied to the places where white patches are seen.

(‘नक्तं जाता’ ‘सुपर्णो जातः’ इति सूक्तद्वयेन श्वेतकुष्ठापनोदनाय भृंगराज हरिद्रेन्द्रवारुणी नीलिकाः पिष्ट्वा शुष्कगोमयेन शिवत्रप्रदेशं अलोहितदर्शनं प्रधृष्य लेपयेत् । (vol. I.P. 124)

ii) पृश्निपणी: (Uraria picta)

This is another plant which has spotted leaves. It destroys the root of diseases. The vedic seer considers it as कण्वजंभनी (II. 25. 1). Sāyana explains this term as पापस्य नाशयित्री. The plant helps to cure the disease coming from the sins. It is a potent herb and it destroys the evil germs that sucks blood. Sāyana instructs that the hymn शं नो देवी पृश्निपर्णी (II.25) should be chanted while applying the paste of पृश्निपर्णी to the parts of leprosy.

कुष्ठादि सर्वरोगकर्मणि अनेन सूक्तेन पृश्निपर्णी
पेषयित्वा लेपयेत् ।

Vol. I. p.283

iii) जंगीडमणि :

The AV occasionally refers to jangīḍa plant. This is used against several diseases. The जंगीडमणि has been considered as deity in the hymn (II.4). It cures विस्कन्ध i.e. shoulder joint pain or rheumatism or some type of arthritis. The term मणि stands for the medicinal yaṭi like चन्द्रप्रभावटी of āyurveda. Hence yaṭi means a pill or a tablet or a capsule. The जंगीडमणि, has thousand of powers (सहस्रवीर्यः) and it protects from lock - jaw (जम्भात्) polio (विशरात्), rheumatism (विस्कन्धात्) and mental depression (अभिषोचनात्). The atharvan was sure that जंगीड will protect always from all side. (xix -33,34).

iv) दश वृक्षाः

The reference of दशवृक्ष appears in AV several times. The hymn (II.9) considers दशवृक्ष as a deity. The seer requests the deity to destroy the joint-pain. The maṇi prepared by दशवृक्ष will cure many diseases. Kauśika states - ‘पालाश उदुम्बरः जम्बुः काम्पिलः स्रक्व.धः शिरीषः सक्त्यः वरणः बिल्वः जंगीउः कुटकः गुह्यः गलावलः वेतसः शिम्बलः सिपुनः स्यन्दनः अरणिका अश्मयोक्तः तुन्युः पूतदारुरिति शान्ता वृक्षाः । एतेषां कतमानामपि दशानां शकलैर्निर्मितः मणिः । (vol. II p. 653). The fire sticks (समित्) of दश वृक्ष used in the आज्यहोम will cure all the diseases.

v) अर्जुनः (Terminalia arjuna)

An amulet prepared by the straw of अर्जुन, blossom of barley and blossom of sesame and consecrated by the hymn (II.8) will destroy all hereditary diseases.

वभ्रो इति तृतीयया अर्जुनकाष्ठसतिलपिंजिकाः एकीकृत्य
अभिर्मन्त्र्य कुलागतकुष्ठक्षयग्रहण्यादि रोगशान्तये बध्नीयात्

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vi) पलाशः (*Butea monosperma*)

Palāśa is one of the important trees and it is one of the śāntavṛkṣas. Sāyana advises to use the firesticks (समित्) of पलाश in आज्यहोम with hymn (I.4) to cure all types of diseases. (सर्वरोगभेषज्यकर्माणि अनेनैव सूक्तेन आज्यहोमं पलाशोदुम्बरादि शान्तवृक्ष समिदाधानं च कुर्यात् । vol.I.P. 31) The पर्णमणि of पलाश is used for lustre, valour, longevity etc. One should wear it after the consecration by the hymn (III.5) (आयगमन् पर्णमणिः इत्यनेन सूक्तेन तेजो बलायुर्धनादि पुष्टये पलाशवृक्षमणिं वासितं कृत्वा संपात्य अभिमन्त्र्य बध्नीयात् । vol.I. P. 360) It is said that Palāśa is a good herb (उत्तमो अस्योषधीनां) and all other trees are subordinate to it. (vi. 15)

vii) कुष्ठ (*Saussurea lappa* or *Costus speciosus*)

कुष्ठ is the name of a disease as well as a name of a plant which helps to cure that disease. Kuṣṭha is a skin disease. There are two hymns (v.4 : vi.95) in the Av which describe Kuṣṭha herb. It grows in the mountains (गिरिष्वजायथा). It cures takman (तक्म नाशन) a skin disease. It relieves from the diseases of head, defects of the eye, and maladies of the body. (v.4.10). Sāyana instructs to anoint the patient with the powder of Kuṣṭha mixed with butter to the part where the skin disease has spread by chanting the hymn (vi.95)

अश्वत्थो देवसदनः इति तृचेन
राजयक्ष्मकुष्ठादिरोगशान्त्यर्थं कुष्ठाख्यौषधि मिश्रितं
नवनीतम् अभिमन्त्र्यप्रतिलोमं व्याधितशरीरं प्रलिम्पेत्
vol. II p.191

viii) अपामार्गः (*Achyranthus aspera*)

अपामार्ग is one of the important plants used in the āyurveda. There are four hymns (iv. 17, 18, 19 & vii 67) in AV addressed to अपामार्ग Vanaspati. According to Sāyana apāmārga is so called because it wards off the diseases. (अपमृज्यते रोगादि निराकरणेन पुरुषः शोध्यते अनेनेति अपामार्गः—: । vol. I. P. 614) The seer addresses the plant - O apāmārga, death due to hunger, death due to thirst, want of cows and want of children. all these, we wipe off with your aid.
क्षुधामारं तृष्णामारमगोतामनपत्यताम् ।
अपामार्ग त्वया वयं सर्वं तदप मृज्महे ॥

AV IV-17-6

Apāmārga is surely the only sovereign of all the plants. With that we wipe away your chronic disease. You may move about free from affliction.

अपामार्ग ओषधीनां सर्वासामेक इद्वशी ।
तेन ते मृज्म आस्थितमथ त्वमगदश्चर ॥

Av IV-17-8

Apāmārga is used to wipe off all the hereditary defects and diseases and to ward off evil effects of witchcraft. दर्भ and सहदेवी are used with अपामार्ग in महाशान्ति to ward off the bad effects of अभिचार.

ix) शमी : (*Prosopis spicigera*)

We come across a hymn (VI-30) in which śamī is extoled as a deity. The vedic seer recognises the medical value of the śamī and states - The intoxication is that which makes hair grow and increase and which enables a

man to smile. I cut off other from your proximity. O śamī may you grow up with hundreds of branches.

यस्ते मदोवकेशो विकेशो येनाभिहस्यं पुरुषं कृणोषि ।

आरात्वदन्या वनानि कृक्षि त्वं शमी शतवल्दा विरोह ॥

AV VI.30.2

Further he adds that शमी will take care of the hair like a mother to her sons (मातेव पुत्रेभ्यो मृह केशेभ्यः शमि VI.30.3) Sāyana instructs to sprinkle the water with शमी by chanting the hymn (VI.52) to the patient. (शमीसहितोदकेन अनेन तृचेन अभिमंत्रितेन व्याधितं अवसिंचेत् । vol.II.P.104). But शमी is called as केशहन्त्री by धन्वंतरीय निघण्टु (P.188) and केशमथनी by राजनिघण्टु (P.188). Moreover Charaka considers शमीफल is injurious to hair. (च.सू. 27.160). Thus there is difference of opinion between Vedic seer and āyurvedic authors. But one may easily say that śamī has close connection with hair.

X) रोहणी - अरुन्धती (Healer plants)

Rohaṇī is a plant and it is described as a devata in a hymn (IV.12). The name of the plant itself shows that it will help to grow. Vedic seer states - O Rohaṇī you are healer; the healer of broken bone. You may heal it.

रोहण्यसि रोहण्यस्थनश्छिन्नस्य रोहणी ।

रोहयेदमरुन्धती ॥

A.V. IV.12.1

The hymn describes the process of healing vividly. Sāyana instructs to sprinkle लाक्षोदक consecrated by the hymn on the wounds to stop the flow of blood.

रोहण्यसि सूक्तेन शस्त्राभिघातजनित रुधिरप्रवाहनिवृत्तये
अस्थ्यादिभङ्गनिवृत्तये च लाक्षोदकं कृतं आभिमन्त्र्य उपःकाले
क्षतप्रदेशम् अवसिंचेत् ।

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The rohiṇī plant is used to join the bones. There is another plant called अरुन्धती which is also used for healing. अरुन्धती is known as सहदेवी or सिलाची. Whitney opines that अरुन्धती is the name of climbing plant having healing properties (on IV.12. P.166). The word अरुन्धती is associated with 'arus' - wounds in the sense of healer of wounds.

xi) अजशृङ्गी / मेषशृङ्गी

(*Odina wodier* / *Odina pinnata*)

अजशृङ्गी is a herb which is used to destroy the germs. The hymn (IV.37) of AV describes the medicinal quality of this herb. Atharvan seers, Kaśyapa, Agastya, Kaṇva killed the germs with the help of अजशृङ्गी. The herb has power to kill the germs living in the water as well as living in the soil. The smell of this herb makes the germs to quit that place.

त्वया पूर्वमथर्वाणो जधू रक्षांस्योषधे ।

त्वया जघान कश्यपस्त्वया कण्वो अगस्त्यः ॥

त्वया वयमप्सरसो गन्धर्वाश्चातयामहे ।

अजशृङ्गयज रक्षः सर्वाङ्गन्धेन नाशय ॥

A.V. IV. 37-1,2

Monier Williams identifies अजशृङ्गी with मेषशृङ्गी. But Singh and Chaunekar do not agree with this. According to them they are different plants. Kauśika does not prescribe अजशृङ्गी in the practice but uses शमी instead.

xii) पिप्पली - (*Piper longum*)

Pippali is an important plant used in āyurveda prescription. It is considered as a devatā in a hymn (VI-109) and it is a remedy for mental diseases. It is sufficient to keep the patient alive. Sāyana opines that this plant came in to existence during अमृतमन्थन. (तादृशीं पिप्पली देवा इन्द्रादयः अमृतमथनसमये सम कल्पयन् सम्यक् काल्पितवन्तः । (vol. II. P. 222) Pippali is used as a remedy for वातरोग. Sāyana advises a patient suffering from घनुर्वात क्षिप्तवात etc to drink water with पिप्पली which is consecrated by the hymn (vi-109) (पिप्पली क्षितभेषजी इति घनुर्वात क्षिप्तवातादि कृत्स्नवात व्याधि शान्त्यर्थं पिप्पली संपात्य अभिमन्त्र्य पुनस्तृचं जपित्वा आशयेत् । Vol II. P. 221)

Thus there are many plants, herbs and trees which are described in AV in connection with medical ritual. Sāyana and Kauśika have narrated the usage and the utility of the plants in detail. The munja (*Saccharum munja*) is prescribed for diarrhoea, over flow of urine and overflow from fistula (vol. I.P.205). Paṭā or Pāthā (*Clypea hernandifolia*) plant is remedy for infectious diseases. The plants Varuṇa (*Crataeva nurvala*) and Kramuka (*Morus indica*) are used for विषनिवारण (vol. I. P. 539). The amulet of वरूण वृक्ष consecrated by the hymn (Vi-95) helps in curing राजयक्ष्मरोग (vol II. P. 176). For eye defects and diseases one should wear an amulet made of सर्षप (*Brassica campestris*) upon which the drugs of oil have been poured with the hymn. (कौशीकसूत्र 30-1)

The xix Kāṇḍa of AV refers to दर्भमणि and so on. All these manīs help to cure the diseases. There are some plants which give strength, virility, progeny, beauty and lustre. All such plants are considered as द्रव्य in the medical ritual. Various mantras are chanted during the ritual. आप्लवन, आसेचन, अभिसिंचन, tying an amulet, offering fire sticks, giving some drinks are the rites of this ritual.

Medical ritual is an impressive therapy. The chanting of mantras during ritual create vibrations and it will effect on growing cells. The vedic mantras bring sanctity to the ritual. The plants, herbs or trees have medical Values and they cure the diseases. This brings reliability in the ritual. The various rites of the ritual create confidence in the mind of the patient. Thus the medical ritual process of AV is a psycho-somatic therapy.

Books :

1. Atharvavedasamhita with sāyaṇacārya commentary (Volumes 4) Ed. by. Shankar Pandurang Pandit, Krishnadasa Academy Varanasi 1989
2. Atharvaveda samhita with English Translation (Five Volumes) by swamy satyaprakasha saraswati, Veda pratisthāna New Delhi. 1992
3. Relevance of plants, Herbs and materials used in the Rituals, Ed. by Dr. G.N. Bhat, CIDSRS canara college Mangalore 1999
4. Medical Ritual in the Atharvaveda Tradition by S.S. Bahulkar, Tilaka Maharashtra VidyaPeetha pune 1994.

'Trees and Plants associated with Grhya-rituals'

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In Grhya-ritual various trees and plants are used. Fuel-sticks and Darbha-Grass are commonly used almost at every step. A great variety of trees and plants are mentioned in connection with the medical ritual of the Grhya-type. This ritual is found in Kauśika-sūtra which is a Grhya-sūtra of the Atharvaveda. In Vedic times trees and plants were a part of magicoreligions rather than biological phenomena. There were numerous superstitions about trees and plants. It was expected that Grhya-rituals would fulfill the needs of people in general. The study of trees and plants in the Grhya-rituals is helpful in understanding the vedic life. In this paper an attempt is made in this direction.

In ancient Indian life vegetation played an important role. It was in plenty & was available easily. So people made maximum use of vegetation in all the aspects of life. The Grhya-ritual was not an exception to this general object. We notice that different trees and plants are prescribed to be used in the Grhya-ritual. People were aware that there was some power in various trees and plants. This power could be helpful or harmful. Therefore the trees and plants were always used along with some formulae of magicoreligious nature. These formulae may add the utility of trees and plants to remove their harmful nature. The trees and plants have a particular role to play in the medical magicoreligious ritual. In this paper it is intended to show the use of vegetation in Grhyasūtra with a special reference to the medical ritual in the Kauśikasūtra. The

Kauśikasūtra is a Grhyasūtra of the Atharvaveda.

To purify water, one is advised to use Darbha-blades (Āśvalāyana-grhya-sūtra (ĀGS) I.3.3.). The Brahman priest takes a blade of Darbha grass from his seat and throws it towards the south-eastern direction with the formula *hirastah parāvasuḥ* (Gobhila-grhyasūtra I.6.14). In the Sīmantonnayana-rite the hair of the bride are to be deposited among other things, with bunches of Darbha-grass (ĀGS I.12.4). For Pārvaṇa Homa one has to bring fuel-sticks and Darbha-grass in the same manner as that of the New and full-moon sacrifices. (ĀGS I.8.3). A vedic student has to put a fuel-stick in the fire at the time of the Upanayana-ceremony (ĀGS I.18.20). The site to be chosen for building a house is expected to be containing ample Kuśa-grass (ĀGS II.7.3) When the house is to be built, in the pit of the central pillar, one has to spread Kuśa-grass and then pour water in which rice and barley-grains are put. (ĀGS II.8.18) At the time of making one's daily study, one has to spread a large quantity of grass as a seat and sit there (ĀGS III.2.2) In this context it has been remarked that Darbha-grass is metaphorically the same as the juice of plants (*eṣa oṣadhīnām rasa yad darbhaḥ* ĀGS III.2.2).

Trees and plants are supposed to be containing some mystic power in them. Therefore, one has to be very careful in having connection with them. Thus when one is coming home after marriage, along with one's wife, wherever one finds some auspicious trees on one's way, one has to pray while muttering the formula *mā*

vidan paripanthinaḥ (may not the enemies find us) (ĀGS I.6.6) Different plants and trees or herbal products are used in Grhya-ritual. In the Simantonayana-rite one has to use a bunch of Udumbara fruits at the time of departing the hair of the bride (ĀGS I.12.4; Pāraskara Grhyasūtra I.15.4 etc.). In the Upanayana ceremony staffs of different trees are prescribed for students of different castes. Thus palāśa for a Brāhmaṇa, Udumbara for a Kṣatriya and Bilva for a Vaiśya should serve as the staff optionally any one of these can be used for any caste (ĀGS I.11.11-12, PGS II.2.25-28). The staff is carried by the student for the sake of getting long life. The students mystically handed over to the plants so that they may protect him (PGS II.2.21). The Girdle of the vedic student is made out of Muñja-grass (ĀGS I.17.10). According to PGS the girdle is to be used by a student for the sake of removing away bad fame, and getting bright lustre, power etc. Thus the formula to be used at the time of using the girdle is as follows:

iyam duruktam paribādhamānā
varṇam pavitram punatī ma ā gāt
prāṇāpānābhyām balaṁādadhānā
svasā devī subhagā mekhaleyam

-(PGS II.2.8)

Before using a new chariot, one should move around a tree in that chariot and bring branches accompanied by fruits (ĀGS II.6.10). The site on which a house is to be built should be containing many trees and plants (ĀGS II.7.3). But there are numerous superstitions regarding various trees. Thus there should be no Asvattha-tree in the east; no plakṣa tree in the south; Nyagrodha to the west and Udumbara to the north. The Asvattha tree in the east may cause fire; the plakṣa-tree in the south may cause death, the nyagrodha-tree in the west may cause fear of weapons; and udumbara-tree in

the north may cause eye-diseases. Similarly these trees are closely connected with some particular deities. Thus Asvattha belongs to Sūrya, Plakṣa to Yama, Nyagrodha to Varuṇa and Udumbara to Prajāpati (Gobhila-Grhyasūtra IV-7-14). It will be noticed that the trees are not considered to be Botanical or Biological phenomena but rather a magicoreligious phenomenon. Before building house one has to uproot thorny and milky trees and also one has to remove the plants like Apāmārga, Śāka, Bilvaka, Parivyādha (ĀGS II.7.3-6). The site is sprinkled with water by means of a branch of Śamī and Udumbara (ĀGS II-8-13). In the pits where polls are to be fixed, moss is to be put so that the house will not get fire (na hāsya dāhukaṁ bhavati vijñāyate) (ĀGS II.8.16-17). Before entering the newly built house one should keep various seeds in the house and then formally enter it (bijarato grhān prapadyeta : ĀGS II.10.2) A Student who returns from the house of his teacher, and is about to get married has to carry a bamboo staff (ĀGS III.7.19, PGS II.5.31, Gobhila.G.S. IV.9.13). Such a person should not climb upon a tree (ĀGS III.7.25; PGS II.7.6). This rule is a part of protection of that person. The students returned from the house of his teacher has to pray all the trees and plants before sleeping. At that time he utters formula in which he requests the trees and plants to give him protection (Gobhilagrhyasūtra IV.10.5). The place of cremation is expected to have many trees and plants (bahulans adhikam) (ĀGS IV.1.8). From that place also the thorny and milky trees are to be removed (ĀGS IV.1.9). The place where the dead body is to be kept should be sprinkled with water by means of a branch of Śamī-tree (ĀGS IV.2.8).

At the time of Lāja-homa during the marriage-ceremony, the bride has to offer fried grains

along with the Śamī-leaves. (PGS I.5.1) If a woman cannot become pregnant, then juice of the root of the plant called Śirihī, powdered with water is to be poured in her nostril (PGS I.13.1). Similarly in the Purnsavana-rite which is to be performed in order to get a son, the performer has to pound the shoots of banyan tree with water and pour the juice in the nostril of the woman (PGS I.14.3-4). A student who has returned from the house of the teacher after having completed his education and taken ritual bath (snātaka) has to wash his teeth by means of a stick of udumbara wood (PGS II.5.7) After having cremated a dead body, the relatives should enter their house after having chewed the leaves of Pichumanda-tree (PGS III.9.24). All these examples will show how various trees and plants are used in various domestic rituals according to the Gr̥hyasūtra.

Various trees and plants also find their use in the medical ritual which is also of the nature of Gr̥hya (domestic) and is prescribed by Kauśikasūtra which is a Gr̥hyasūtra of the Atharvaveda. Kauśika sūtra 26.27 prescribes an amulet of red consecrated with AV.I.28 to be used by a person who gets unnecessarily frightened. To the patient suffering from ksetriya (hereditary) disease, an amulet of Arjuna, barley-chaff, and sesam-panicles is bound (26.43). A person suffering from urine-retention should use an amulet of harītaki (2.5.74). In the amulet to be used against the possession of demon, a herb named Salampuspā is to be used (28.7). In order to cure a person possessed by a Brahmarākṣasa, the medicine man or priest, binds him an amulet of chips of ten pacificatory trees. (27.5). An amulet of Yava-plant or Yava-corn is bound around the neck of a patient suffering from any disease (18-20). To the patient suffering from eye-disease, an amulet of mustard-plant is to be bound (30.1).

In Kau.Sūtra 8.15.17 Śānta or pacificatory trees and plants are enumerated. They are to be used in pacificatory-rites for evil beings. The trees and plants are as follows : Palāśa, Udumbara, Dambu, Kāmpila, Sraj, Vingha, Śirīṣa, Śraktya, Varāṇa, Bilva, Saṅgida, Kāṭaka, Gārhya, Galavāla, Vetasa, Śimbala, Sipuṇa, Syandana, Araṇikā, Aśmayoktra, Tunya, Pūṭadāru, Citi, Prāyaścitti, Śamī, Samakā, Savamśa, Śyavākā, Talāśi, Sipuṇa, Śimbala, Darbha, Apāmārga, Dūrvā, Pramanda, Uśīra, (Kau.Sū. 8.15-17). In the following rites purificatory trees are used. Thus when a patient is suffering from a disease caused by excessive intercourse, the medicine-man-sprinkles on him water in which forest-sesames, hemp, and wood of pacificatory tree is put (Kau.Sū. 27.33) In a rite of fertilization, a woman should sit on a Śirīsapā-branch, and their the medicine-man or priest should sprinkle on her water in which he has put pacificatory herb (Kau.Sū. 34.1).

At times, there is a magical connection between the name of a plant and the derived result. Thus the word Apāmārga, is derived from the root apa-mrj meaning to wipe off, remove etc. This plant is used in the rites performed in order to remove evil beings (See. Av.IV.176). Similarly the word Yava is derived from the root yu to remove. Therefore Yava-grains are used in the rites of removing the evil beings (.... Kau.Sū. 25.27). The word Muñja is mystically connected with the root muc-(muñcati) to set free. Thus in a rite for curing or meant for making the patient free from fever, Muñja-grass is used (Kau.Sū. 25.6). The leaves of Paraśu (Axe) are used in a rite of caring sores (Kau.Sū. 30.14). The Kramuka tree is used in a rite for curing wounds caused by arrows. The word Kramuka is connected with the word Karmuka (bow) and thus has same mystic connection with arrows (Kau.Sū. 28.2). Bunches (stamba) of grass are used in rite for containing (stamba)

the poison (Kau.Sū. 29.4). In a rite against hair-fall, a plant called nitatnī (that which takes roots) is used (Kau.Sū. 31.2). The word Śamī is connected with the root Śam which means to pacify. Therefore in a rite for pacifying the evil beings this plant is used (Kau.Sū. 28.9). These examples will show the role of magic in the medical domestic rituals.

Numerous other trees and plants are also used in the magicoreligious medical domestic rituals mentioned in the Kauśita sūtra. In a rite for curing someone suffering from the Ksetriya (hereditary) diseases the medicine-man or priest binds pieces of Kāmpila-wood around the joints of the body of the patient (Kau.Sū. 27.7). In a rite for curing any disease, the medicine-man or priest puts wood of Śānta-trees soaked in Sama-juice in the fire and makes the patient inhale the smoke (Kau.Sū. 25.21). To a patient suffering from the poison of arrow, the medicine-man or priest gives Haridrā mixed with butter for consuming (Kau.Sū. 28.4). Haridrā mixed with water and consecrated (AV VII.56) and could be given to a person suffering from the poison of a scorpion or lizard (Kau.Sū. 32.7). In a rite against serpent-bite, bottle-gourd is used. Thus the patient is made to drink water through a bottle-gourd (Kau.Sū. 29.13). Seeds of Pippali are given to a patient suffering from a wind-disease (Kau.Sū. 26.38). Corns of Priyaṅgu on which fresh milk is poured are given to a child suffering from lock-jaw (Kau.Sū. 32.2). If there are worms in the body, seeds of Śigru are to be applied (Kau.Sū. 29.23). In another rite against worms, Uśīra is used (Kau.Sū. 29.75). The Prśniparṇī-plant is used in order to remove

evil beings which cause diseases (Kau.Sū. 26.36). In a rite against hair-fall, the plants like Śirṣa, Akṣa (Vibhitaka), (Kau.Sū. 30.9) or Jivi and Alāka (Bhṛṅgarāja (Kau.Sū. 31.28) are used. In a rite against swelling pollen of a plant called Garī (*Andrepegen serratus*) are to be smeared on the swollent parts (Kau.Sū. 31.15). In order to remove evil beings. Mustard-plants are to be used (Kau.Sū. 26.27). In a rite to make woman fertile the medicine man or priest produces fire out of woods Śamī and Aśvattha. The powder of these burning woods is put in butter which has been procured out of cow's milk having a male calf. This powder is to be applied to the right nostril of the woman (Kau.Sū. 35.8). It may be added that everywhere one has to perform certain ritual like recitation of mantras from the AV. offering of a libation of ghee in fire and then pouring the remnant ghee on a particular tree or plant before using it. Thus it is believed that because of that magicoreligious ritual the potency of a particular tree or plant becomes effective.

In ancient India trees and plants were not merely looked upon as biological entities but also as mythological factor. Thus they considered the vegetation to be power-carriers. With the help of some formulae of ritual one can make their use and avoid their harmfulness. The Gṛhyasūtra literature which is a real mine of information regarding the ancient Indian life which is very rich in many details of magicoreligious medical aspects of trees and plants. This literature therefore deserves to be studied.

DARBHA (*Poa cynosuroides*)

It is one of the essential plants in all sacrifices. This grass is considered as a part of Vishnu. The Hindus believe that this grass possess the virtue of purifying everything. In Badrapada masa this sacred Darbha is worshiped for immortality and is called Darbhashtami.

RELIGIOUS AND MEDICAL VALUE OF DHATHRI, NIMBA AND SHAMI TREES

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Trees and Plants were used by human beings from the time immemorial. Dashvrukshas were the trees mentioned in Vedic texts. Nimba, Shami and Dhathri were mainly used for many religious and medicinal purposes. Probably the fruits of Dhathri were worn in the hands during traveling to alleviate thirst and hunger. In many idols like Avalokitheshwara and Pashupathi we find "Phalapallava" in the hands which is presumed as fruit and branch of some tree. It is observed that the fruit happens to be Dhathri which is instant energy giving. Hastam alakaacharya suggest similar uses of Dhathri fruit.

The tree Shami is identified as one of the sacred trees and often planted near temples and religious places. The leaves of Shami are considered as gold and exchanged during *Vijayadashami*. The great epic *Mahabharatha* also describes the role of Shami before the great war of *Mahabharatha*. However the two sources of Shami tree is as follows.

1. *Prosopis cineraria*

2. *Accacia ferruginea*

Apart from these two sources in central and north part of Karnataka it is noticed that the leaves of *Hardwickia binata* is exchanged in the name of Banni Bangara. However this oral tradition is very interesting and worth investigating

further, since this tree is also having various uses in the temple rituals of village gods.

Neem tree is exclusively Indian in origin. The village god and goddess are often worshiped with the leaves of Neem. It is significant to note that the Vasantharuthu is predominant in Kaphadosha and bitterness of Neem is important toll in preventing rogas of Kapha in Vasantharuthu.

A brief database of three trees are as given below.

Embelica officinalis Gaertn.

V. Names : Beng : Ammo ; E : Indian gooseberry; Guj : Avala ; K : Nelli ; Mar : Avali ; Sans : Vayasya, Amalaki, Shira, Dhathri, Shriphala, Amrthaphala, Tishyaphala ; Tam : Nelli ; Tel : Usarikai.

Habitat : Tree reaching 6-8m ; oblong elliptic leaves, 6 seeded, globose. Paleotropics.

Used part : fruit, root bark, leaf.

Ethnotherapeutics : Oral ; respiratory disorders (Ca Sa Su 2.26, 4.36, Ci 11.66, 17.129, 18.92, 94, 136, 184) Urinary disorders (C Sa Su 2.31, Ci 26.53, Ka 7.46) Skin disease (Ca Sa Su 4.24 SS Su 44.54, 70) fever (CS Su 4.39, Ci 3.202, 207, 220, 225, 230 S Sa Su 38.26) health promoter (CS Su 5.12, CS Su 27.282) obesity (Ca Su 21.23, 26) alcoholic delirium (CS Su 23.38) prevents aging (Ca Su 2.40, Ci 1.1.25, 36,

37, Ci 1.1.41, 46, 58, 65, 75, 76, 77; Ci 1.2. 6, 7, 8, 10; Ci 1.3.3; 12. 17, 41; Ci 1.4.19) (Su Sa Ci 27.5, 6, 10; SS Ci 28.3.6) for virility (CS Ci 2.28, SS Su 38.29 SS Su 46.142) helminthiasis (Ca S vi 7.22) abdominal pseudotumour (CS Ci 5.120, 122, 124, 133) diabetes (CS Ci 6.26, 30, 36, 48, SS Ci 11.5, 12) diseases of mouth (CS Ci 6.137) epilepsy (CS Ci 10.31) piles (CS Ci 14.138, 148, 153, 158, 15.152) anaemia and jaundice (CS Ci 29.98, 99) leucorrhoea and other gynaecological disorder (SS Su 38.27, 38.29) vomiting, polydipsia (SS Su 46.214) gout (SS Ci 5.12, 21) root bark in purpura (CS Ci 4.57)

Wholesome diet : in fever (CS Ci 3.184, 186, 187) dyspepsia (CS Ci 4.35) consumption (CS Ci 8.67), herpes (CS Ci 21.109, 111, 112) alcoholic delirium (CS Ci 24, 139, 140, 183) impure breast milk (CS Ci 30.259) in case and disease for everybody (CS Su 7.61, SS Su 20.4) cardiac condition (SS Su 46.408) disarrhoea (SS Su 46.409) piles (Su S Ci 6.12) skin disease (SS Ci 10.15, 16, 17, 18)

Local : over forehead in polydipsia (CS Ci 22.36) alopecia (CS Ci 26.277).

Enemata : per rectal in helminthiasis (CS Vi 7.17) per vaginal use in gynaecological disorder (CS Ci 30.78).

Contraindication : with milk (CS Su 26.84).

Phytochemistry : ascorbic, inucic and gallic acid in leaf (Basa SC 1987).

Pharmacology : calstrogenic effect modifier (Dhir H 1990) antimutagenic (Grover LS 1989)

Pharmacognosy : Datta SK (1982), Singh RR 1984.

Clinical : Premature ejaculation (Mishra DN 1980), leucorrhoea (Rao TS 1985).

Antimicrobial : (Jain SC 1984).

Azadirachta Indica A. Juss

V. Names : Be : Nim, H:E. Neem, Gu : Limbado, K: Bevu, Mal : Aryaveppu, Vepao, Mar : Nimba, Limba, S : Nimba, Picumarda, Tiktaka, Arista, Paribhadra, Hingu niryasa, Te: Veppu, Tel : Vep.

Habitat : Common avenue tree with white tiny sweet scented flower.

Used part : bark, leaf, seed, oil, twigs as tooth brush. *Ethnotherapeutics* : *Internal* : emetic (CS Su 2.6, CS Ci 21.51, CS Ci 30.253) (CS Ka 2.9, SS Su 43.4) antipruritic (CS Su 4.13) obesity (CS Su 23.10, 12) antipyretic (CS Ci 3.202, 205, 225, 258, SS Su 38.24) pseudotumour (CS Ci 5.115), diabetes (CS Ci 6.30, 31, 38, SS Su 38.3) SS Cu 11.5, 6, SS Su 45.101, skin disease (CS Ci 7.43, 46, 47, 65, 82, 97, 101, 112, 135, 136, 140, 14 SSSu 38.31, SS Su 45.101, SS Ci 9, 7, 8, 12, 32, Ci 1.3, 9) bleeding piles (CS Ci 14.56, 186, 214), sprue (CS Ci 15.126, 136, 138, 182, 190) anaemia (CS Ci 16.48, 53, 87) antiemetic (CS Ci 20.34, 35) herpes (CS Ci 21.54) alexipharmic (CS Ci 23, 51, 69, 79, 202) purpura (CS Ci 4.38) hypermetrorrhagia (CS Ci 30.99) breast milk impurities (CS Ci 30.279) wholesome food; cough bronchitis (CS Ci 17.97) breast milk impurity (CS Ci 30.259) piles SS Ci 6.6) diseases of throat (SS Ci 22.30) skin disease (CS Ci 7.65) fumigation : fever (CS Ci 3.307).

Local/ External : skin disease (CS Ci 3.3, 7, CS Ci 7.57, 129, 157, 158 SS Ci 9.12), (CS Ci 7.103, 112, 135, 136, 140, 144) dropsy (CS Ci 12.72 SS Ci 23.16) bleeding piles

(CS Ci 14.56) chronic wounds, ulcers (CS Ci 25.84, 85, 85, SS Ci 1.66 20.28 SS Ci 17.12) d disease of eye (CS Ci 26.239) musculoskeletal disorder (CS Ci 27.50, 27.27) gout (CS Ci 29.148) gynaecological problem (CS Ci 29.148, 30.74, 82), tooth brush to prevent oral cavity disease (SS Ci 24.3) surgical wounds (SS Ci 25.15).

Boty : Variations in the cotyledonary node (Bansal S 1987) fasciation in twigs (Soni KK 1981).

Phytochemistry : Azadiractin-B, (Rembold H, 1987) nimbolide and 28-deoxonimbolide (Kigodi PGK 1989) tetranotriterpenoids (Siddiqui S 1989) margosinone and sinoline-2 new polyacetate derivatives (Ara I 1989a) tricyclic diterpenoids from root bark and stem bark (Ara I 1990, 1989b).

Pharmacology : hypotensive, bradycardiac action without diuresis (Singh PP 1990) analgesic and poor anti-inflammatory (Tandon SK 1990) antitumour (Kigodi PGK 1989) immunomodulator (Lababu RP 1989).

Clinical : jaundice (Dwivedi ML 1984).

Toxicological : insecticidal (Ali SI 1983, Matemu DP 1986, Pandey ND 1985, 1986, Rout G 1986, Qamar F 1989).

Antimicrobial : Seed oil active against 10 human pathogenic bacteria (Chaurasia SC 1978) antimicrobial (Ikram M 1984).

Cultivation : environmental conditions (Ghate VS 1988) field trials on saline water irrigation (Khan D 1989).

***Prosopis Cineraria* (L.) DRUCE**

V. Names : Beng : Shaya; Guj : Khijade; H: Chokur; Ka : banni; Mar : Shami; Punj : Jaud; S : Shami, Shakthuphala, Thunga, Keshashantri, Shivaphala, Mangalya, Laxmi; Tam f: Kalisam ; Tel : Jammi.

Habitat : Bipinnate leaves, Armed tree. Young pods as vegetable. South East Asia. Bhavaprakasa calls a small variety as Shami.

Used part : leaf, bark, fruit.

Trees grow in plains (CS Ka 1.8).

Ethnotherapeutics : Enteral : fruits edible, sweet (CS Su 23. 159), SS Su 46.199).

Pharmacy : corewood-source as fermented decoction (CS Su 25.49).

Local/External : depilator (CS Su 27.159, SS Su 46.199, SS Su 1.94).

Fumigation of dry leaf in piles (CS Ci 14.49).

Enemata : CS Vi 8.144, CS Si 10.30.

Phytochemistry: octacosanol, n-hexacosanoic acid, 4-octa cosanoic acid, sugars (Swami KD 1989) flavanoids of flowers (Bharadwaj DK 1979) prosogenic, a new flavone (Bhardwaj DK 1978).

Pharmacology : Shankaranarayana D 1979.

Toxicity : Shankaranarayan D 1979.

Abbreviations : C.S. = *Charaka Samhitha*, SS. = *Sushrutha Samhitha*

TREE OF LIFE : THE GIVING TREE

Source: Environmental Health Perspectives (1994 Vol 102(12):1009-1010)

The neem tree may provide answers to some of the toughest environmental and health questions.

For thousands of years, the people of India have known about the powers of the neem tree. They clean their teeth with neem twigs, heal skin disorders such as ulcers and eczema with neem-leaf juice, drink neem tea as a tonic, place neem leaves in their grain bins and cupboards to ward off insects, and pour neem tea on their plants to repel insects.

Now scientists around the world are researching the possibilities that the neem, a member of the mahogany family, could provide answers to many global problems such as including reforestation, cancer prevention methods, pesticide alternatives, and population control, including a role in the development of a male birth control pill.

"Even some of the most cautious researchers are saying that neem deserves to be called a wonder plant," according to Noel Vietmeyer, the study director of a 1992 National Research Council report entitled "Neem: A Tree for Solving Global Problems."

Indian scientists began research on the neem in the 1920s, but their work was little recognized until a German entomologist, Heinrich Schmutterer, witnessed a locust plague in the Sudan in 1959. Schmutterer began researching the neem when he saw that the only plant survivors of the plague were neem trees. Interest in the tree spread,

and by 1991, several hundred researchers in over a dozen countries were conducting research on the neem. The U.S. Department of Agriculture has been studying the neem tree since 1972.

One of the most promising benefits of the neem tree may be the use of neem extractions in new organic insecticides. According to the World Health Organization, over 20,000 deaths and a million illnesses each year result from misuse or overuse of pesticides in the Third World alone. Neem insecticides have many advantages over traditional chemical methods: research indicates they are not harmful to humans or animals, insects don't become resistant to them, neem extracts do not accumulate in the environment, and they also spare beneficial insects like butterflies and ladybugs.

Entomologists have found that neem compounds can affect more than 200 insect species, including mosquitoes, fruit flies, head lice, Japanese beetles, Colorado potato beetles, Gypsy moths, fire ants, fleas, cockroaches, and boll weevils. The neem serves as a unique insecticide in that its compounds do not immediately kill insects, but rather alter insects' behavior or life processes in subtle ways as to impair the insect so that it can no longer feed, breed, or metamorphose.

The chemical structure of the neem contains only carbon, hydrogen, and oxygen, in

contrast to inorganic, synthetic insecticides. The neem relies on four major compounds which act as antihormones in combating insects, and these are backed up by some 20 or so other minor, less active compounds.

The four major compounds, azadirachtin, salannin, meliantriol, and nimbin, are of the general class of natural products called triterpenes, or more specifically, limonoids. Azadirachtin is the major agent for warding off insects, causing about 90% of the effect on insects. It repels and disrupts the growth and reproduction of insects by interrupting the process of metamorphosis by blocking molting, thus ending the insect's life cycle.

Meliantriol and salannin both repel insects by causing them to cease eating. The fourth compound, nimbin or nimbidin, is involved in antiviral activity, affecting potato virus X, vaccinia virus, and fowl pox virus. Other neem ingredients also work as antihormones, including some that are able to paralyze certain insects' swallowing abilities.

It is a fairly simple process to obtain these compounds by extracting them from the seed kernels of the tree. Crushing the kernels and extracting them with water is the most effective way for village peoples to obtain neem insecticides. Scientists have developed more advanced processes and means to convert neem extracts to forms of granules, dust, wettable powders, or emulsifiable concentrates. Scientists have also developed formulations, including the addition of chemicals or chemical modification of the neem ingredients, to increase shelf life of products or to reduce phototoxicity, the damage to sensitive plants.

There are currently four neem-based insecticides available on the U.S. market.

AgriDyne Technologies, Inc. manufactures Azatin, Turplex, and Align. Azatin, which was introduced in 1992, is produced for use on ornamental plants, such as greenhouse plants and flowers. Turplex, also introduced in 1992, is used for turf and lawn care, while Align was introduced last year for use on food crops. W.R. Grace manufactures Margosan-O, which is now registered in all 50 states, also for use on food crops. The EPA has approved the use of both Align and Margosan-O for food crops. According to John Cuomo, the director of chemistry research at AgriDyne, the products have been accepted very well by growers, and the company continues to receive many requests for the products.

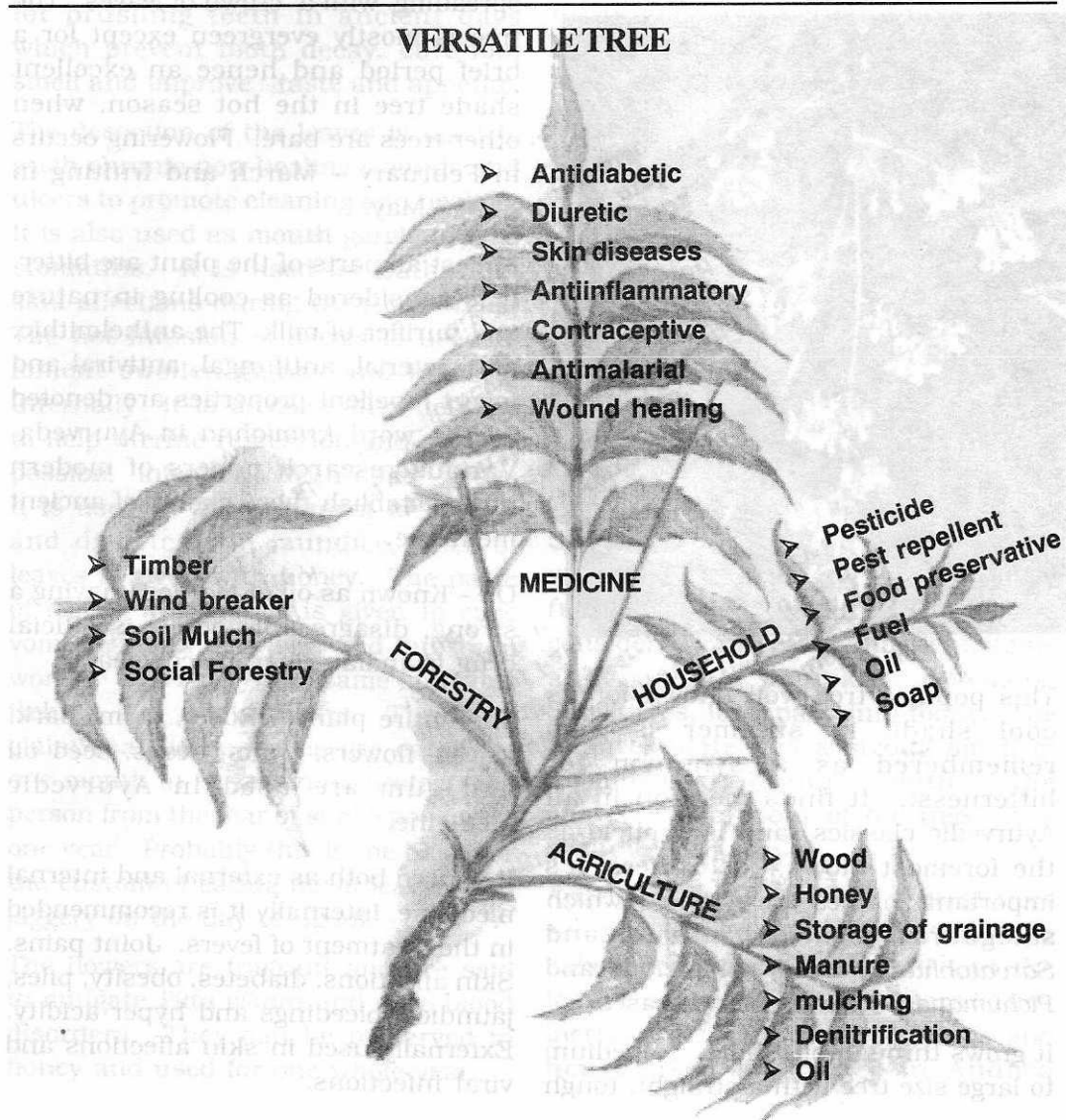
Although the neem seems to have endless possibilities, there are some disadvantages that need to be overcome. According to the NRC study, "the truth is that despite all its properties and promise, some impediments must be overcome and many uncertainties clarified before neem's potential can be fully realized." For example, neem products sometimes degrade and lose their pest-control properties when exposed to sunlight. This has been mitigated in some U.S. products by the addition of sunscreen. Cuomo said that the AgriDyne products do not contain sunscreen because it is not necessary for them to be effective. On a positive note, he said because of the UV breakdown and the hydrolysis of the neem products, they decompose rapidly, preventing buildup in the environment.

Although there appear to be few adverse human health effects of neem ingredients, further toxicity tests need to be conducted. Toxicity tests on fish and other wildlife also require investigation. Another disadvantage

of the use of neem insecticides is that they kill insects by delayed action, so they work slower than synthetic pesticides. Consumers who have become accustomed to instant results may be impatient with the slower action of neem insecticides. Cuomo said that although AgriDyne's products are slow-acting, they are very effective if used for a full season.

Perhaps one of the greatest advantages of the neem is the fact that its fruits may be harvested without destroying the tree, making the neem more profitable standing than felled. As stated in the NRC report, "the use of neem products has the merit of promoting a greening of the earth."

VERSATILE TREE



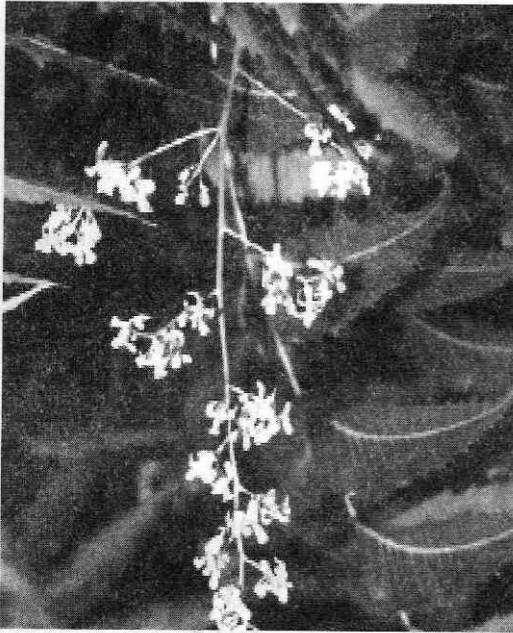
NIMBA, BILVA AND DHATRI

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NIMBA

Bot Name : *Azadiracta indica*
Fam : Meliaceae



This popular tree well known for its cool shade in summer is also remembered as a synonym for bitterness!. It finds mention in all Ayurvedic classics and is upheld as the foremost blood - detoxifier. Its important names are *Nimba* - which safeguards health, *Arishta* and *Sarvatobhadra* - very auspicious and *Pichumanda* - cures skin diseases.

It grows through out India. A medium to large size tree with a straight, tough

trunk having greyish black vertical ridges on its bark. The bark exudes a thin gum which is brownish red to blackish. The branches are large and spreading with a crown of leaves. The tree is mostly evergreen except for a brief period and hence an excellent shade tree in the hot season, when other trees are bare. Flowering occurs in February - March and fruiting in April - May.

Almost all parts of the plant are bitter. It is considered as cooling in nature and purifier of milk. The anthelmithic, antibacterial, antifungal, antiviral and insect repellent properties are denoted by the word *krimighna* in Ayurveda. Various research papers of modern times establish these claims of ancient medicine.

Oil - Known as oil of Margosa having a strong, disagreeable odour is official drug in Indian Pharamacopoeia.

The entire plant - Roots, stem, bark, leaves, flowers, fruits, seeds, seed oil and gum are used in Ayurvedic Medicine.

It is used both as external and internal medicine. Internally it is recommended in the treatment of fevers. Joint pains, Skin affections, diabetes, obesity, piles, jaundice, bleedings and hyper acidity. Externally used in skin affections and viral infections.

Decoction of the root/bark is used as a bitter tonic and antacid. It cures all types of fevers including malaria. The strach extracted from the fresh bark is used to cure malarial fevers and it is tolerated better by most of the patients. It also cures the weakness and loss of appetite found during and after the fevers. It also shows anti-diabetic properties. The tender twigs were used for brushing teeth in ancient days which prevent tooth decay, cure foul smell and improve taste and appetite.

The decoction of the leaves is used to wash chronic non-healing wounds and ulcers to promote cleaning and healing. It is also used as mouth gargle to heal stomatitis. It is used for bathing in skin affections during their out-break. The hot infusion of leaves is used to foment swollen glands and bruises. Internally it is advised after delivery to help uterine regression and prevent possible infection. With other drugs it is used in the treatment of obesity and diabetes. In jaundice, juice of leaves is given with honey. The paste of leaves with honey is given to cure vomiting, skin diseases and intestinal worms. Externally the same mitigates itching and heals ulcers. The texts claim that if the leaves are eaten for one month in *vasantarutu*, protect the person from the fear of snake poison for one year. Probably this is the basis for the custom of eating neem leaves with jaggery on the day of Ugadi.

The flowers are fragrant and are said to mitigate *Pitta vikara* and cure blood disorders. They can be preserved in honey and used for one whole year.

The pulp of the fruit is eaten by humans animals and birds. It is considered as a tonic, antipyretic, purgative, emollient and antihemintic. It is helpful in urinary diseases and piles.

The dry fruits are bruised in water and used to treat skin diseases.

The seed oil, commonly known as neem oil is greenish yellow to brown in colour. Medicinal properties of the oil are attributed to the presence of bitter principles and odorous compounds. It is an useful remedy in chronic skin diseases, ulcers, rheumatism, leprosy and sprain. Intra - uterine medication of oil controls different types of inflammations. Warm oil relieves ear trouble. Few drops of oil taken with betel leaves gives relief in asthma and *vata* affections. Margosa oil mixed with hair oil is reported to prevent baldness and greying of hair by regular usage. It is also useful in killing the lice.

Some trees, especially near the watercourses exude a sap naturally from the stem-tip. The sap is considered refrigerant, nutrient, tonic and useful in skin diseases. Sometimes, it is made into toddy. The fresh exudate has a strong smell of fermented liquor with the characteristic odour of the tree. It is slightly sweet.

Apart from medicine, its general uses are also varied and numerous. The cake after extraction of oil and the leaves are used as fertilizers. They increase the milk output in cows and hence used as fodder in Andhra

Pradesh. Neem oil is a well known pesticide in agriculture. The leaves are kept amongst the woollen cloth and books to protect them from pests. They are also used as insect repellents. The dried leaves, powdered kernel when mixed with food grains protect them against the pests and increase the storage period. Grains treated with these neem products do not show any untoward effect either in taste or in smell after washing and cooking. Considerable quantities of the oil are employed in cosmetic preparations such as creams, hair lotions, medicated soaps, washing soaps and toothpastes.

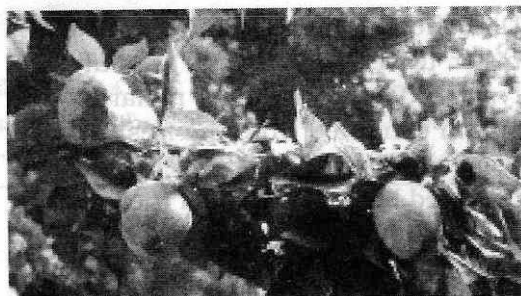
The wood is employed in furnitures and agricultural industry. The chief constituents of different parts of the plant are Nimbin, Nimbinin, nimbidin, azadiractin etc. The oil contains sulphur. The leaves are rich in minerals, proteins, carbohydrates and vitamins. Important Ayurvedic preparations include Nimbadi churna, Nimbarishta, Vranaropana taila, Pancha nimba churna.

BILVA

Bot Name : Aegle marmelos

Family : Rutaceae

Bilva is mentioned in all ancient scriptures of Ayurveda as well as in Rigveda and Yajurveda. It is considered as one among the auspicious trees, specially for worshipping lord Shiva and Goddess Durga. Some of its synonyms describe its morphology and uses. For eg, *Shiva druma* -the tree of Shiva, *Sadaphala*-always bearing fruits,



Durarudha-difficult to climb as it is thorny, *Trishikha*-three leaved, *Shriphala* and *Lakshmi phala*-Showing its connections with Goddess Lakshmi and so on.

It is classified under various groups in Ayurvedic texts which highlight its important actions.

It is moderate sized, slender, aromatic tree growing wild through out the deciduous forests of India, ascending to an altitude of 1200 mts in western Himalayas and also occurring in Andaman islands. It can withstand various types of soils, climatic conditions and a PH range of 5 to 10. It is drought-hardy and fairly frost resistant. It is cultivated commonly near the temples for its leaves which are used in worship and for the fruits which are edible. It is propagated by the seeds root cutting (Suckers) and layers. But the seeds have short viability and are much liable to insect attacks. A basic survey identifies about twelve varieties depending on the characteristics of fruits.

The tree sheds all the leaves for a short time in hot season-usually March-April. The new shoots and leaves appear towards the end of April, flowers in May and fruit setting starts at the end of

May. Though a large number of flowers appear, number of fruits is restricted, the fruits require about a year to ripen and hence the tree is seen with fruits through out the year and so called as *SadaPhala*. The green fruits become yellowish on ripening.

The fruits are official in Indian pharmacopoeia. In Ayurveda-all the parts of the plant-root, bark, leaves, fruits-both ripe and unripe find different uses-internally and externally. The root is an ingredient of *Dashamoola*, which are used to alleviate fever and pains. It is the foremost of *Vatahara* drugs and used individually and in combinations: The decoction of roots reduces pain of piles when used for sits bath. The twigs are rubbed with water and this paste is applied over abscesses and swellings.

Juice of the leaves given with honey cures swellings. This can be used for rubbing over the body to stop the foul smell in case of obese persons. It is also used as an eye drop in conjunctivitis. Bilva patra is one among the *Pancha Pallava* which are used to treat vomitings and nausea by virtue of their fragrance. Paste of the leaves, applied over the forehead calms down the delirious fever patient. The same applied over the chest liquefies the phlegm. Poultice of the leaves is applied over the eye lids in ophthalmia. A powder prepared with Bilva patra, Nimba patra, Soapnut and Kachoori is an excellent bathing powder which keeps the skin healthy.

Unripe or half ripe fruit (Ardha pakva phala) is regarded as astringent

digestive and stomachic. It is used in chronic diarrhea and dysentery, and said to act as a tonic to the heart and brain. In the after treatment of bacillary dysentery, the fruit is an useful adjuvant as it helps to remove constipation which hinders healing of ulcerated surfaces of intestines. The preparations used commonly are fruits, liquid extracts from dried slices of the unripe fruit and the powdered dry pulp. The fruit can be cooked in the red hot charcoal and the pulp is eaten with jaggery. A syrup can also be prepared with the pulp and used to stop the loose motions. The tender fruit is also utilized in the preparation of murabba, which can be preserved as a household remedy for dysentery and diarrhoea.

The ripe fruit is sweetish with an aroma and is regarded as astringent, cooling and mildly laxative. The pulp diluted with water, added with requisite amounts of sugar and tamarind forms a delicious cooling drink popularly known as bael sharbat in north India. The preserved pulp of ripe fruit is used to prepare various food products like bael fruit squash, jam and fruit nectar.

Apart from medicinal uses it finds a place in the culture of the country. The timber is prized for sacrificial and religious offerings. It is used for making agricultural tools. In Assam, it is used for carving and in Gujarat for furniture, in Kerala, for making fishing boats. It is also useful for the manufacture of railway keys, break blocks, and for manufacturing wrapping paper. The astringent rind of the ripe fruit and the bark are employed for dyeing and tanning.

Chemical composition: The dry pulp of fruit stem contains mucilage-pectin like substance. Root and bark contains marmelosin, aegelin, and alkaloid haplopine. Trunk and bark contains aegelinine, mamesin and some steroids. Leaves yield rutin, marmesinin and essential oil.

The Ayurvedic preparations include Bilvadi Vati, Bilvadi lehya, Asana Bilvadi taila, Bilvadi churna and Dashamoolarishta.

DHATRI

Bot Name: Emblica



Officinalis

Fam: Euphorbiaceae

Dhatri, commonly known as Amalaki is one of the most important drugs in Ayurveda. It is also cited in Rgveda, Skanda Purana, Ramayana and Garuda purana. The famous story of Chyavana states that he was rejuvenated by a preparation called chyavana prasha which was prepared by Ashwini kumars and it contains Dhatri as the chief constituent. Maharshi Charaka calls it as the foremost among rejuvenators and names the first chapter on rejuvenating therapies as *Abhaya Amalaki rasayana pada*. The *rasayana*

drug according to Ayurveda is one that nourishes all tissues, stabilizes all sense organs, improves functions of all systems and thus prolongs span of life. [cha,chi l]

The name *Dhatri* means a nurse or mother which highlights its healing nourishing and soothing qualities. It is also called as *Shanta* - pacifying, *vayastha* - retaining youth, *Amritha*-keeping death away, *Vrishya*-aphrodisiac, *Shiva*-beneficial etc.

The plant grows through out India upto 4500 ft. The tree is small to deciduous with a crooked trunk. Leaves are feathery with small pinnately arranged leaflets which are similar to tamarind leaves. Flowers are greenish yellow. Fruits are fleshy, pale yellow to brick red colour when matured. They are 1-2.5 cms in diameter, sour and astringent in taste. The Benaras variety of fruits is said to be of best variety which weighs about 45-50 gms each, and has a small seed with more pulp. The fruit is the richest source of vitamin C. The fruit juice contains nearly 20 times as much vitamin C as orange juice and a single fruit is equal in antiscorbutic value to one or two oranges. The tannin content of the fruit, prevents or retards the oxidation of vitamin C, and gives the fruit it's invaluable qualities in the fresh, as well as dry states. Apart from fruits, leaves, bark and seeds are also used in medicine -both internally and externally.

Externally the fruit juice and powder is applied to the scalp to promote hair growth and prevent graying. oils medicated with it can be used for the same purpose. Decoctions of the fruit heals the wounds faster. Paste of fruits alleviates burning sensation. Juice or

decoction instilled in eyes cures eye disorders.

Internally used, it promotes health and vigour. It enhances appetite, decreases hyper-acidity, cools the body and controls diabetes. The syrup or morabba prepared with fruit and sugar candy cures giddiness and nausea. Given along with gokshura, giloi, and honey in the morning works well as a rejuvenator. It is called as *rasayana churna*. The famous combination *Triphala* is prepared with chebulic and belleric *myrobalans*. Used with loha bhasma, it is useful in anaemia, jaundice and indigestion. Fresh fruit juice with sugar cures burning micturition and haematuria (blood in urine). The powder of fruits is helpful in diarrhoea and white discharge.

The seeds are powdered and used in the treatment of white discharge, bronchitis and biliousness. The leaves ground in buttermilk are employed in the treatment of loose motions. The decoction of leaves is used as a gargle in mouth ulcers.

Decoction of the bark and root is helpful in alleviating indigestion. Along with

giloi and turmeric it is useful in urine complaints and diabetes.

The fruits, leaves and bark are rich in tannin. Immature fruits are employed for tanning. The leaves and fruits are used as fodder. The fruits are also used in the preparation of writing inks and hair dyes. The leaves contain a brownish yellow colouring matter used in dyeing silk and wool. They are also used as manure in areca and cardamom plantations. They may also be used for ameliorating alkali soils.

The wood is used for agricultural equipments, and for well-work as it is durable under water.

The fruit is a rich source of pectin & is esteemed for making pickles, preserves and jellies. It also contains two tannins one bound to gallic acid and the other with ellagic acid and glucose.

The seeds contain a fixed oil, phosphatides and an essential oil.

Ayurvedic preparations include triphala churna, chyavana prashavaleha, Dhatriyasava, Bhringamalaka taila, Dhatri loha etc.

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ECO-TECHNOLOGY – CALL IT BY ANY NAME

Environmental awareness has grown tremendously all over the world in recent years. This together with the world market for flowers & medicinal plants have greatly contributed to the rise of cultivation. Forest departments, religious institutions, business organizations, in the name of ecofriendly, ecotourism and health resorts are establishing Navagraha Vana, Rashivana, Pavitravana and so on. Whatever may be the name given these are setting a trend for the preservation of biodiversity with a touch of religious attitude. During the Vedic Period, the Rishis imparted the message of conservation of natural resources through religious activity or rituals. The activity or the rituals was handed over from one generation to the other forgetting about the motto. Now from the scientific point of view it is viewed with a flavour or ritual either to attract people from all walks of life. The nine trees that are planted in Navagraha Vanas include examples from six different families. A visit to such vanas may help common man to expose himself to the plant biodiversity.

Tulasi, the Religious Plant and its impact on Mankind

Dr.N.G. RAGHUMOHAN

Former Head and Principle Scientist, ICAR

Tulasi plant is known as *Ocimum Sanctum* in taxonomy. This divine plant in India is referred to as Vishnu Priya, Divya, Bharati, Krishnamul, Basil, Danvanthri and so on. There are three species of Tulasi that are worshipped in India. They are referred as Sree Tulasi, Krishna Tulasi and Karpura Tulasi. The Sree Tulasi has green leaves and branches profusely and is common in southern Karnataka households. The Krishna Tulasi is most similar in morphology to Sree Tulasi but, the leaves are little bigger and dark brown in colour with a tinge of Indigo and are referred as the Shymala Varna of Sri Krishna. This plant is very common in Northern Karnataka.

ಪತ್ರಂ ಪುಷ್ಪಂ ಫಲಂ ಮೂಲಂ
ಶಾಖಾತ್ಮಕ್ ಸ್ಕಂಧಸಂಜ್ಞಿತಮ್ |
ತುಲಸೀ ಸಂಭವಂ ಸರ್ವಂ
ಪಾವನಂ ಮೃತ್ತಿಕಾದಿಕಮ್ ||

[The leaves, flower, seeds, root, stem and even the soil which provides it a base are considered holy]

The Chemistry of Tulasi and its relationship for cholesterol control and heart beat :

It is amazing to narrate here the vital importance of Tulasi and how in our Hindu ritual it has been kept as a code of secret in the form of rituals and sampradhaya. Let us take the eg. of Chromium (Cr^{4+}). There are

Bhagavata Purana

Krishna reveals himself to Arjuna about his manifestation when he gives his several forms, with reference to plants he says

Among the trees, he is Aswatha.

Among the shrubs he is Tulasi.

Among the grasses he is Darbha.

Tulsi leaves have sweet aromatic scent and acts as a cough elixir. Hindus swallow one or two leaves after their meals as an aid to digestion. It is said that it can help in keeping the temperature of the stomach at a proper level.



more than 104 elements in the periodic table and everyone is familiar with it. For plant, animal and human beings 18 elements out of 104 elements are basically required for their growth and health. These 18 elements are referred as essential elements. In that the role of (Cr⁺⁺) has been highlighted here.

The importance of cholesterol control has been sighted with the role of the micro element chromium. It is interesting to know that Tulasi plant absorbs all these above said elements in appropriate doses. Further, Geological Survey of India has brought out in their study on lesser elements that Tulasi is one of the plants that absorbs the chromium to the maximum extent from the soil. On the contrary this is to say that wherever there is Tulasi plant there the soil is rich with Cr⁺ It has been stated that consumption of more fat brings in more cholesterol that in turn has to exhaust chromium in metabolic process in fat metabolism.

Tulasi has a significant role in controlling diabetic:

A randomized, placebo-controlled cross-over single blind trial on 40 human volunteers suffering from type II diabetes was performed during the four week trial, subjects alternately received a daily dose of 2.5g of Tulasi leaves powder or a placebo for two week periods. The results showed 17.6% reduction in fasting blood glucose and 7.3% decline in postprandial blood glucose on treatment with Tulasi as compared to the blood glucose levels during treatment with placebo. (Ref. Agarwal et.al, 1996)

Tulasi as anti-fungal, anti-viral and anti-bacterial (3 in 1):

It has been demonstrated that Tulasi leaves and plant as a whole is anti-fungal, anti-viral and anti-bacterial. This is the only plant, which has three in one remedy as a medicinal herb. It can cure the common cold of viral origin and the fever coming through

'Tulasi' symbolises Goddess Lakshmi and is known to be the only thing used in worship which can be reused in pooja and considered as self purifier.

तुलना नास्ति अथैव तुलसी

That which is incomparable in its qualities is Tulasi

यन्मूले सर्व तीर्थानि यदग्रे सर्व देवता यन्मध्ये सर्व वेदाश्च तुलसी तां भजाम्यहम्।

I bow to the Tulasi at whose base are all the holy places, at whose top reside all the deities and in whose middle are all the vedas.

bacterial infection and that of skin infection of fungal origin. It has become a household remedy that many people use Tulasi as a native kashayam (tonic) for cold and cough. The recent epidemic that endangered mankind namely SARS can also be effectively controlled by using Tulasi, this has the potency of improving the respiratory tract when it is inhaled (Ref. Rathanankara, Ayurvedic remedies). The Tulasi flower inflorescence contains very effective oils referred as Eugenol and Methyl Chvainol. The medical research on the essential oil of Tulasi has given spectacular results on antibacterial, antifungal and antiviral properties. It inhibits the growth of micro organisms.

Tulasi and stress control in the present day fast life:

Tulasi leaves help to soothe the agitated nerves, relieves tension and sharpen memory as indicated by studies by a medical group. However, Tulasi as antistress has adaptogenic effects. Extracts from the plant have been found to reduce stress considerably.

Tulasi as a Cosmetic :

The Tulasi being used as a culinary herb, Tulasi has medicinal and cosmetic uses too. The essential oil extracted from leaves and flowers are used for fragrance in perfumes and soaps. In addition to this the essential oil applied externally are beneficial for cuts, wounds, abrasions, bites and stings and as a face wash for acne(teenage pimples).

Tulasi seeds and urinary track infection:

It has been advised to take Tulasi seeds crushed or taken as an extract of decoction. This removes the urinary track infection when taken for a period of 15 days with one spoon a day. In fact in Puri Jagannath temple it is very common to use the Tulasi seeds in place of mustard seeds in the temple prasadam. It has a very high aroma, pleasant taste and also gives vigour and vitality.

Thus the role of Tulasi has many facets of imparting many beneficial effects and controlling the human health which is the real wealth of mankind. Such a plant of hidden secret in the Hindu tradition from ancient times has been unravelled with a scientific message.

The person who has never experienced the aroma of the Tulasi leaves from the lotus feet of the Lord is like a dead body, although breathing

Saunaka Rishi - Srimad Bahagavatam 2.3.23

CHANDANA AND NARIKELA

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गंधं गृहाण देवेशि उत्तमम् दिव्यचन्दनम् ।

विलेपनं सुराधीशे प्रीत्यर्थं प्रतिगृह्यताम् ।

[This shloka is recited while offering sandlepaste to the Lord]

A tree bears fruits for others sake, a river flows to help others, a cow gives milk for people sake. This life is there to help others. This description fits in very well in case of sandalwood also. Chandana is an important item to be offered to the deity in all rituals. It is given to the participant in the worship after offering to the deity. It is applied on the forehead, arms and sometimes to the whole body. It has immense medical value. Sandalwood when rubbed against a stone gives out sweet aroma, which is having an enchanting effect on man since ages. Sandal is one such drug, which not only emits sweet fragrance but also enriches ones life with health and prosperity. Indians have high regards for Sandalwood since ages. Srigandha occupies a special space in every Hindus house. On Akshaya Tritiya, which falls on the third day of Vyshakha shukla, Sandal paste is applied on Sri Raghavendra swamy's Brundhavana. In many temples sandal paste is mixed with water and offered to devotees as thirtha. When one leaves for the heavenly abode, sandalwood is burnt along with the dead body, so that the environment does not get polluted. Sandalwood carvings have dual action, one it decorates the place where it is kept. Other it purifies the environment where it is kept.

There is a mention of Sandalwood in Ayurvedic texts in the chapter of Ruthucharya (do's and don'ts to be followed in a particular season) in vasantharuthu, one should anoint himself with sandal paste and agaru after taking bath. And one is advised to drink kashaya prepared out of ginger and chandana. Even in sharadruthu one is advised to apply a paste of chandana all over the body. Let us now know the medicinal part of this sacred sandal. The most sacred wood, the SANDALWOOD is included under many groups (gana) by different Ayurvedic Acharyas. The great Acharya Charaka has included sandalwood in

दाहप्रशमनगण	Group of drugs, which alleviate burning sensation.
अङ्गमर्दप्रशमनगण	Group of drugs, which alleviate body pain
तृष्णानिग्रहण गण	Group of drugs which alleviate thirst
वर्ण्य गण	Group of drugs, which imparts colour to skin
कण्डूघ्न गण	Group of drugs which alleviate itching
विषघ्न गण	Group of drugs which acts as antidote to poison.

It is also included in thiktha skandha (group of drugs which have bitter taste) Acharya Sushruta has included chandana in Salasaradhi gana, patoladhi gana, sarivadhi gana, priyangvadhi gana, guchyadhi gana and pithasamshamana gana. The synonyms of chandana speaks out its qualities. These synonym are : श्रीगन्ध (Srigandha), andhasara, Malayaja.

In Kannada it is known as Srigandha, in Hindi it is called Safed Chandan and Sandal Wood in English, its botanical name is *Santalum album*. It is the heartwood and oil, which is used for medicinal purpose. The properties of a drug are measured in terms of rasa, guna, veerya, and vipaka. The qualities of chandana has been thus explained in our classical Ayurvedic texts by our great Acharyas:

चन्दनं शीतलं रुक्षं तिक्तमाह्लादनं लघु।
श्रमशोषविषश्लेष्मतृष्णपित्तास्रदाहनम् ।। भा. प्र.

The qualities of chandana are :- it has laghu ruksha guna, thiktha madhura rasa, katu vipaka and sheetha virya. Due to these properties it is kapha and pitta dosha shamanaka. All are aware of the fragrance emitted by sandalwood but many are unaware of the unlimited medicinal values of sandalwood. Now let us take a lion's view of these valuable properties of sandalwood in the order of different systems of our body.

LOCAL APPLICATION

Chandana has cooling action on the body when applied externally. Hence it is used in all conditions where there is burning sensation. Hence it is a very useful application in case of herpes, which has

burning sensation as a main symptom. Sandalwood has been included in varnya gana as it imparts colour to the skin, hence sandal is an important ingredient in all face packs and is a compulsory item in all the bathing powders. Excessive sweating is a common problem faced by all during summer, it becomes intolerable when sweating becomes offensive. The sweet smelling sandal is the right answer to this problem. Be it in the form of paste or powder or sandal powder sachets kept in between the clothes, all serve the same purpose. The other advantage is sandal wood powder when applied locally alleviates prickly heat and checks copious perspiration. The qualities of chandana are thus put forth in Charaka samhitha in the form of a beautiful and concise shloka.

चन्दनं दुर्गन्धहरदाहनिरवापणलेपनानाम् ।।
(च.सू. 25)

It means sandal is the foremost among all in alleviating bad odour, daha (burning sensation) when applied as lepa (application) externally. Here is a simple tip to keep the face flower fresh. Mix a teaspoon of sandal paste, turmeric powder, milk cream and little Bengal gram flour. Mix well and apply this to face once daily and see the change it brings in your complexion. A simple tip to make your face pimples free, mix four teaspoons of chandana powder with four teaspoons of honey and four teaspoons of lemon juice. Apply this to face and see how the pimples vanish. Sandal wood oil mixed with double the quantity of mustard oil is a good application for pimples on nose. Chandanadhi taila (an oil prepared with chandana as main ingredient) is a classical

preparation which when applied to the face regularly improves complexion and prevents skin from tanning.

Sandal oil works excellently in scabies when applied externally. Also in scabies, sandal wood seeds powder mixed with sour buttermilk should be applied. Its other uses are, it can be applied externally to scorpion stings and in cases of headache, which is predominantly of pithaja type. It can be applied on temples with good results. When one is suffering from pitha predominant skin ailments sandal powder mixed with ananthamoola powder and amalaki choorna (powder) in equal quantity should be taken in hot water. Along with this sandal oil or til oil should be rubbed over the affected part. In case of sidma (a type of skin disease) a paste prepared out of srigandha and vacha choorna mixed along with buttermilk should be applied.

ANNAVAHA SAMSTHANA (Digestive System)

Sriganda has been included in trushna nigrahana gana and in daha prashamana gana (group of drugs which alleviates burning sensation), thus it is extensively used during summer in the form of panakas (juice) to reduce severe thirst. In case of morbid thirst powder of sandalwood should be mixed with tender coconut water and drunk to get a better benefit. Bad breath—the answer lies in this remedy a decoction of sandalwood should be gargled twice a day. Prepare fine powders of chandana, amla, cumin seeds, yasti draksha (dried grapes) and dates in equal quantity and mix well. To this mixture add sugar powder (quantity equal to the quantity of all the above ingredients). This powder should be taken

along with cold water in treatment of raktha pitha (a disease where there is bleeding from different pores of the body), wheezing, burning in the body, burning sensation in head, and in fever due to pitha dosha. Infusion of chandana, ushira, dhanyaka draksha along with sugar, taken cold, relieves thirst and giddiness.

RAKTHAHAVA SAMSTHANA (Circulatory system)

Sandal wood due to its blood purification property, is used in diseases caused by vitiated raktha and it is also beneficial to heart.

PRANAVAHA SAMSTHANA (Respiratory system)

Due to its bitter taste chandana acts on kapha dosha. This expels the accumulated kapha and relieves the fetid smelling sputum. In chronic cough cases, chandana comes to help. This can be safely used when there is haemoptisis and pus in sputum. Usually in all the above conditions it is used in combination with other drugs.

JWARA: (Fever)

As chandana has cooling property it comes in handy when one is suffering from fever. Chandana is one among the six ingredients of shadanga paneeya, a cold infusion that is beneficial in fever.

उशीरपपटोच्यमुस्तनागरचन्दनैः।

जले शृतं हिमं पेयं पिपासाज्वरनाशनम्।

(शा.सं. मत्वाण्ड)

The other ingredients are usheera, parpata, udheecha, musta, nagara. This drink helps, one who is suffering from severe thirst and fever.

The decoction of patola, chandana, pata, and amrutha relieves pithaja jwara (fever), burning sensation and itching. The decoction of amrutha, mustha, chandana, usheera, and nagara with honey and sugar cures jwara, thirst and burning. Chandana helps in calming mind and thus can be given in mental worries and disturbances.

MOOTRAVAHA SAMSTHANA: (Urinary system)

Sandal acts as a diuretic and hence can be used in urinary tract infection. Sandal wood helps in bringing the blood sugar to normal values and hence is one among the anti diabetic ingredients.

Chandana by sacrificing itself spreads fragrance and health to humanity, being also favorite to divinity. Taking chandana as a model, now let us start to Protect, Preserve, Promote and propagate the unlimited medicinal values and the valuable tree. This is the one and the only way to express our gratitude to CHANDANA.

NARIKELA

Kalpavruksha is a heavenly tree, which emerged out of ksheerasagara when it was churned for the elixir of life "Amrutha". Kalpa vruksha means "Bestower of all that is desired". This kalpavruksha is limited to devaloka. COCONUT TREE can be called

पूगीफलसमायुक्तं नागवल्ली दलेर्युतम् ।

कर्पूरचूर्णसंयुक्तं ताम्बूलं प्रतिगृह्यताम् । ।

*[The worship of any god or goddesses will be incomplete
without this shloka offering coconut, betel nut and betel leaf]*

Even during preindustrial period a few plant families have played a prominent role as a source of edible and nonedible raw materials. For the entire world three plant families stand out in terms of their past and present utility to human kind. They are the grass family (Graminae) the legume family (Leguminosae) and the palm family (Palmae - तृणदुम). If the geographic focus is narrowed to the tropical regions the importance of the palm family is obvious.

The assortment of products that can be obtained from palms is very impressive. Every part of the coconut is useful and hence has been elevated as Kalpavriksha. The palm varieties are sources of folk medicine and are part of rituals. A combined medicinal and ritual role can be attributed to betel nut palm. (Areca catechu). People of Asia chew betel nut along with betel leaf and lime. It is a classic Asian Masticatory. The betelnut contains an alkaloid that is mildly narcotic.

Coconut, betel nut and date are the three palms used in many parts of the world. The chemical composition that relates with the medicinal value can be seen Dates are the rich source of potassium, Vit-A and Vit-B.

the kalpavruksha of bhooloka. It is a valuable tree that is bestowing health and happiness to man since ages. It is believed that coconut tree has been gifted with a wonderful sense of understanding human voices, among all the trees that grow on Earth. It is said that the coconut tree which are in school compound grow better than others due to the singing, playing and screaming of the innocent children who study in the school. Not only this narikela is held in high esteem in all religious functions and rituals. It is considered as an auspicious sign. It is offered to God as Naivedya (offering). It is also offered as a token of devotion during pooja. It is believed that all Gods and Goddesses reside in this fruit hence while performing vrathas like sathanarayana vratha it is established as a kalasha and then offered pooja. It is used as an edagai to ward off evil spirits, not only this it is hung in the corner of house to serve the same purpose. In all auspicious functions like wedding, threading ceremony it is a tradition to give coconut to all the invitees, this implies that let peace, health and happiness reside in every ones house. The tender coconut is offered as thirtha in many temples and also it is used to do abhisheka to the deity. In a nutshell Narikela is held in high esteem by one and all due to its abundant good qualities.

Now let us look at the different references, which are quoted in our classical ayurvedic texts regarding coconut. In Kannada it is named TENGINA MARA, in Hindi it is NARIAL, in English COCONUT PALM, Its botanical name is *Cocos nucifera*. The synonyms of Narikela are:

- a) दृढफल : That which has hard fruit
- b) लांगली : That which has tail
- c) तुंग : That which is tall
- d) सदाफल : That which bears fruit through out the year.
- e) दक्षिणात्यक : That which grow specially in southern part.

Usually these synonyms tell something about its physical appearance or about its working properties. Narikela has been included in Narikela kula. Each and every part of this tree is useful to the mankind and every part is imbibed with medicinal properties. The parts, which are usually used in medicine, are fruits, flower, oil and root. The properties of coconut has been given in a nut shell as follows

नारिकेलफलानि च ।

बृंहणस्निग्धशीतानि बल्याणि मधुराणि च ।।

नारिकेलं गुरु स्निग्धं पित्तहनं स्वादु शीतलम् ।

बलमांसप्रदं हृद्यं बृंहणं बस्तिशोधनम् ।।

(सु.सु 46)



Breaking coconut & offering the same to God is a symbol of breaking the ego. By breaking the ego the sweet water of joy & love come out of it. Kernel is the fruit one can enjoy.

नारिकेलो गुरुः स्वग्धः शीतः पित्तविनाशनः ।
अर्धपक्वस्तृषाशोषगमनो दुर्जरः परः । ।

(रा.नि)

It has guru and snigdha guna, madhura rasa, madhura vipaka and sheetha veerya. Due to these characters it alleviates vata and pitha doshas. The properties of coconut oil is explained like this:

नारिकेलोद्भवं तैलं बृह्माणं बलवर्धनम् ।
केश्यं पित्तानिलहरं दन्त्यं धुरमेव च । ।

The oil has brumhana guna and has madhura rasa. It increases strength, it helps in hair growth and alleviates vata and pitha doshas. It is useful in dental problems. Now let us go through the invaluable medicinal uses, which this great tree is providing to the welfare of mankind.

Local application:

Had a fall and the area has swollen up and giving lots of pain? Pound a well grated coconut and then mix it well with four times

of turmeric powder. Fry it well and prepare a potalli (take a square long cloth and place the mixture in the middle and catch hold of all the four ends and tie it like a bag) and give fomentation to the affected place. Coconut has a very wide scope in the field of cosmetics. Milk extracted out of kernel should be mixed with kaliyeera and has to be applied to freckles to make the face clean.

Want to give a face lift to your face but tired of synthetic cosmetics, try this. Mash fresh kernel and prepare a paste massage it over the face, it prevents early appearance of wrinkles and keeps the face flower fresh. Milk extracted from fresh coconut kernel mixed with glycerin can be applied to face to improve complexion, this combination can be applied to chopped feet and hands. To cure pimples and prevent premature wrinkles massage the face with fresh kernel once a day it keeps the face flower fresh. Likewise tender coconut water can also be used for washing face and this prevents premature wrinkling and this improves complexion. Everyone is aware of

Composition of Coconut Shell, <i>Cocos nucifera</i> (dry basis)			
Chemical	Lignin	Cellulose	Ash
%	36%	53%	0.6%

Nutritional Composition of Coconut Water, <i>Cocos nucifera</i>			
Water (%)	95.5	Carbohydrates (%)	4.0
Protein (%)	0.1	Calcium (%)	0.02
Fat (%)	0.1	Phosphorous (%)	0.001
Mineral matter (%)	0.4	Iron (mg/100 g)	0.5

Source : FAO Report, 1998

coconut oil used as a hair oil but as a cosmetic —No!! Add a few drops of fresh lime juice to coconut oil and massage it over face; this cleans the tiny pores and helps the skin to breath normally. This combination when applied to chopped skin, cracked nipples, nappy rashes help to heal quickly. When one wants to get one's face bleached but is afraid of its adverse effect, a simple combination of coconut oil with few drops of lime juice applied to face helps to get a similar effect. To give hair a brilliant look mix a few drops of lime juice to coconut oil and apply to hair.

The ash of burnt coconut shell should be mixed either with coconut oil or mustard oil and used as an ointment for ringworm infestation. All have heard of coconut oil ever heard of an oil that is extracted out of coconut shell!! Yes, a tarry oil extracted from the shell of the coconut is used externally only, in ringworm infection with gratifying results. This oil can also be used for removal of corns. Soak rice in tender coconut water till it becomes smelly. Then remove it and grind it well to make a paste. Apply this paste to cracked feet and a type of skin infection sidma. Adding a pinch of turmeric powder to coconut oil and applying it to the affected area can treat vaginitis

caused by mild fungal infection. To help the child grow healthy apply coconut oil mixed with equal quantity of butter and expose him to sunlight daily

Annavaaha samsthana

In case of stomatitis, which is due to vitamin-B deficiency, chewing dry kernel along with sugar candy will help. When one is suspected of tapeworm infestation a glassful of coconut milk should be drunk early in the morning, which should be followed by an ounce of castor oil after 3-4 hours. A cup of decoction of coir helps in expelling tapeworm and round worms. To harden gums and to prevent dental carries and bad breath one should chew a piece of coconut and jaggary. When the tooth and gums become weak and loosen without any apparent cause one can try gargling with decoction of root. Ash of burnt shell when mixed with salt and pepper can be used as an excellent dentifrice. When one has an attack of dysentery and diarrhoea and heading towards dehydration tender coconut water acts as a boon. Giving a teaspoon of tender coconut water every ten minutes not only quenches thirst but also restores the electrolyte balance. This simple remedy comes to use when one is suffering from

प्रथमवयसि पीतं तोयमत्स्यं स्मरन्तः
शिरसि निहितभारा नारिकेला नराणाम् ।

*Though taking very little water in its tender age it carries
on its head and gives very sweet water throughout its life.*

hiccoughs without any underlying reasons. Burn the coir around the coconut to ash. Mix this in water thoroughly then allow it to settle, now decant the clear supernatant solution and drink to get good results. In older people and children whose digestion power is low tender coconut water should be mixed well with mashed ripe banana and used to regain strength and vigor. In case of protein deficiency and rickets coconut milk is a cheap and effective food medicine, which can be easily supplied to rural children.

Mix one well ripened grated coconut kernel with approximately 250 Gms of rice flour and leave it for 10 mins. Then fry this mixture to light brown on a low flame till it starts emitting pleasant smell and coconut becomes crispy. After the mixture gets cooled mix elachi powder and store it in airtight container. This mixture is mixed with little sugar and ghee whenever required and is eaten as snacks. This is both nutritive and delicious as coconut contains proteins (essential amino acids) and vitamin B and C, iron, phosphorus and potassium, which are all very much needed for the body. A classical medicine narikela lavana is of great use in stomach pain, indigestion and other problems related to gastrointestinal tract. Tender coconut is free from fiber and so it is easily digested hence those who suffer from indigestion and colitis can make use of this. It can also be used by diabetics, as it does not contain fat or starch.

Narikela pak :

This is a sweet prepared out of coconut just like coconut burfi. It is digestive, carminative

and also a rejuvenator. The ingredients and procedure is thus:

Ingredients:

well ripened grated coconut	150gms
Cow's milk	300gms
Cow's ghee	75gms
Almonds	50gms
Sugar candy	300gms

Prakshepaka dravyas: (the drugs to be added in the last)

Dry ginger, Pippali, Tej patra, Cinnamon, Clove, Elaichi, Nut meg (each of these drugs 3 Gms), Camphor, Kesar, Pepper

Procedure:

Mix the grated coconut with the milk and fry it well on low flame to prepare a khowa. Now fry this khowa in ghee on low flame till light brown then grind the almond and add this to the above mixture and keep it aside. Now prepare sugar candy syrup of three-thread consistency. To this syrup add the khowa prepared earlier and mix well to prepare a homogeneous mix. Add the fine powders of prakshepaka dravyas to this and mix well. Pour this mixture to a ghee smeared plate and allow it to cool. Later cut it into desired shape.

Indications:

When one takes this according to his digestive power, it increases the stamina and sexual power. It improves strength and health when taken during winter season.

RAKTHAVAHA SAMSTHANA

As flower and tender fruits have styptic property they are used in cases of raktha pitha (a disease where one bleeds through different pores of the body). When one suffers from burning sensation in palms and soles without any apparent reasons the below said remedy can be tried out. Mix tender coconut water and a pinch of turmeric and equal quantity of lime water and apply this over the affected part.

PRANAVAHA SAMSTHANA

In cases of allergic cough milk extracted from coconut kernel should be mixed with a tablespoon of poppy seeds milk and tablespoon of honey. This combination should be taken every night. This is an effective medicine in dry cough due to excessive smoking. Here is an effective tip to strengthen lungs of people who work in dusty atmosphere. Ground fresh kernel in a glassful of tender coconut and add sugar candy powder and a little cardamom this juice should be drunk once a day to get gratifying results.

MOOTRAVAHA SAMSTHANA

Tender coconut is the cheapest food diuretic, which is sterilized also, and that which is freely available in nature. Tender coconut has high content of potassium and other minerals and hence plays an important role in urinary output and this helps in elimination of sulphur drugs and other antibiotic that are administered during infection. This also aids in quick absorption of drugs and make their peak concentration in the blood easier by its electrolytic effect. Thus this effect cures the disease faster with fewer doses of drugs. Hence tender coconut water can be safely given in typhoid, colitis, dysentery, diarrhoea and bronchitis. Mix tender coconut water with coriander seeds powder and use it in cases of burning micturition to get relief. In kidney failure, tender coconut water should be very carefully given under the strict supervision of a specialist or better to be avoided.

PRAJANANA SAMSTHANA

A combination of tender coconut water and honey is said to tone up nerves and hence stimulates the sexual centers. The root is

नारिकेलोद्भवा त्रीणि सिग्धा शीतातिपुष्टिदा ।

गुर्वी सुमधुरा वृष्या रक्तपित्तानिलापहा ।

[भावप्रकाश]

Thick cold coconut milk is very nutritious. This thick sweet coconut milk is supposed to be a medicine for diseases connected with blood, liver and gastric ailments.

COCONUT SHELL CARBON FOR LEAD FILTRATION FROM EFFLUENTS

Lead is one of the widely used non ferrous metals in industry. It is used in storage batteries, pigments, fuels, photographic materials and so on. This metal is released into the atmosphere from various sources and has become a causative agent of public health. Lead is a cumulative poison and it does not permit utilization of oxygen and glucose in the body. The accumulation of lead causes anaemia, kidney dysfunction and brain damage.

This concept of poisoning effect materials was explained by sushruta.

तृणेषु भक्तेषु च दूषितेषु शीदन्ति मूर्च्छन्ति वमन्ति चान्ये ।
विद् भेद मृच्छन्त्यथवाग्निं यन्ते तेषां चिकित्सां प्रणयेद्यथोक्तं ।।

In order to reduce the effect of lead pollution various methods are employed. One such novel methods is the utilization of coconut shell carbon for the removal of lead from industrial effluents. Different types of carbon has been prepared for use as adsorbent for the heavy metal, lead. The dried coconut shell is powdered and sieved to an average particle size of 0.35mm. About 5gms of coconut shell will yield approximately 1.3gms of powder. By treating this powder with nitric and sulfuric acid two types of carbons have been prepared. They are called N-carbon and S-carbon indicating nitrated and sulfonated carbon.

Chemical Constituents of Arecanut, *Areca catechu*

Constituents'	Green Nut (range)	Ripe Nut (range)
Moisture content (%)69.4 - 74.1)	38.9 - 56.7	
Total water extractives (%)	32.9 - 56.5	23.3 - 2.9
Polyphenols (%)	17.2 - 29.8	11.1 - 17.8
Arecoline (extraction method) (%)	0.11 - 0.14	0.12 - 0.24
Fat (%)	8.1 - 12.0	0.12 - 0.24
Crude fiber (%)	8.2 - 9.8	11.4 - 15.4
Total polysaccharides (%)	17.3 - 23.0	17.8 - 25.7
Crude protein (%)	6.7 - 9.4	6.2 - 7.5
Ash (%)	1.2 - 2.5	1.1 - 1.5

Source : FAO Report, 1998

used in uterine diseases. The tender unopened inflorescence is given to pregnant women to help her to give birth to a beautiful and healthy baby. Ash of the coir has abundant styptic property hence this ash mixed with tender coconut water and sugar candy can be given in doses of 1-1½ teaspoon twice or thrice daily to treat excess menstrual bleeding, bleeding piles and also in excessive acidity in stomach.

As always, our ancestors are right even in case of coconut, by rightly calling it as KalpaVruksha. Now it is left to us to make

the maximum utilization of this valuable tree and grow it further for the utilization of generations to come.

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DATE PALM

The Prophet Muhammad said "Tell me, which of all the trees is most like a Muslim". And then they (companions) suggested various trees of the desert, but he said, "It is the Date Palm". (As narrated by Ibumar; Bukhari, Muslim)

Further prophet said "Whoever eats 7 dates between dawn and dusk, will have no harm come to him between dawn and dusk. (Kukhari).

Nutritional Compositional of Date¹ Fruit, *Phoenix dactylifera* (100 g, edible portion)

Water (%)	22.5	Iron (mg)	3.0
Food energy (cal)	274	Sodium (mg)	1
Protein (g)	2.2	Potassium (mg)	648
Fat (g)	0.5	Vitamin A (IU)	50
Carbohydrate (g. total)	72.9	Thiamine (mg)	0.9
Carbohydrate (g. fiber)	2.3	Riboflavin (mg)	0.10
Ash (g)	1.9	Niacin (mg)	2.2
Calcium (mg)	59	Ascorbic acid (mg)	0
Phosphorus (mg)	63		

Source : FAO Report, 1998

AROMATHERAPY IN ANCIENT INDIA

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समस्तगन्धद्रव्याणां देवत्वमपि जन्मभूः ।

भवत्या समर्पितं प्रीत्या मया गन्धादिगृह्यताम् ॥

Introduction :

Man is dependent on plant kingdom for a variety of benefits. The life on earth without plants and trees is unimaginable. It is the most valuable gift given to the mankind, the proper use of which promotes health and prosperity in the society.

The ancient text of Rig Veda classifies the plants into two groups as –

1. रसप्रधानम् आहारद्रव्यम् ।

The one which is prominent in taste and helps in the growth of the body are called food plants.

2. वीर्यप्रधानम् औषधद्रव्यम् ।

The one which is strong enough to prevent the body from diseases or cure the diseases are termed as medicinal plants.

In the medicinal plant, there are five important parts used in the preparation of medicines.

पत्रमूलत्वगादींश्च औषधार्थं तु देहिनाम् ।

The leaves, roots, bark, flowers and fruits (The word 'आदि' in the above quotation includes flower and fruit. The seeds are the parts of the fruits and not taken separately) are used in preparing medicines in different forms. The usual forms of medicines are –

1. कषायः *Decoction* : This is prepared by extracting the juice from the required part of the plant and boiling it with other ingredients.
2. तैलः *Oil* : Extraction of oily substance mainly from seeds which are well dried.
3. लेह्य *Paste* : Preparation of paste like medicine, usually heating with jaggery to make its taste tolerable.
4. चूर्ण *Powder* : Drying the part of the plant used for medicine and making a fine powder out of it.
5. पेय *Drinks* : Mixing the medicine with some liquid.

These are some of the methods by which the medicine is made to enter the digestive system. From this system, the medicine enters the blood stream to reach the affected part and cures the diseases.

Different from all the above methods, there was another type of treatment called Aroma therapy which was more effective and natural.

What is Aroma therapy?

'Aromat' is a middle English term, meaning, 'Spice'. The word is used in old French, Latin and Greek also which has the meaning 'spice or sweet herbs'.



AROMATIC PLANTS



Gundumallige : *Jasminum Sambac* (Oleaceae)



Nagalinga Puspha : *Couroupita guianensis*
(Lecythidaceae)



Parijatha : *Nyctanthes arbor* (Oleaceae)



Jaji : *Jasminium officinale* (Oleaceae)



Champaka : *Michelia champaca* (Magnoliaceae)



Rose Mary : *Rosemarinus officinalis*
(Limiaceae)

Now the word 'Aroma' is used in the sense of an agreeable odour, fragrance or a distinctive characteristic odour.

'Therapy' is derived from a Greek word, 'Therapeia' with the meaning, 'service', 'care' or 'medical treatment'. According to Webster's dictionary, it is a curative device or process or activity.

Therefore, 'aroma therapy' means the curative process using distinctive characteristic odour. In Sanskrit it can be called as, 'गन्धचिकित्सा'.

In other methods described in the introduction, the medicine enters the digestive system and then goes to the blood stream. In Aromatherapy, the patient is made to inhale the medicine which enters the lungs and then absorbed by the blood. Taking deep breaths, more medicinal aroma can be made to enter the respiratory system. The curative effect is fast and permanent. The aroma is said to be the prominent prospect of the earth, 'गन्धवती पृथ्वी'. The plants release this odour to the atmosphere. Some of the parts like flowers do it naturally, but in some cases, the part has to be burnt to get strong odour. The particles of medicine carry this odour to the particular parts of the body when inhaled and the effect is almost instantaneous. We have seen tear gas bringing tears to the eyes. The smell of sweet meats make the mouth water. This shows that the glands get activated by aroma. Thus the body parts cooperate in this therapy which can be effectively used to cure the disease.

The three important 'दोष' which are the root cause of diseases are 'वात', 'पित्त' and 'कफ' (त्रिदोष). The aroma treatment is particularly

useful in removing 'कफ' without making the patient to gulp the bitter medicine, without affecting the digestive system. It naturally cures the diseases and hence is an important type of therapy.

Why Aroma therapy ?

Aromatherapy has many advantages over the other methods.

1. We have five sense organs, eyes, ears, nose, tongue and skin. We can keep our eyes closed, if we don't want to see. Similarly other organs can be controlled at our will, but we cannot close the nose for more than a few seconds. Therefore, good and bad odours enter our body without our knowledge and produce their effects on the body. Thus pollutionfree atmosphere is necessary for healthy population. Hence the aroma treatment is necessary to prevent as well as to cure the diseases.
2. This method is easy, effective and fast. In this, the medicine directly enters the blood stream with no side effects on the digestive system.
3. Food and water can be tested and purified in small quantities before using them. Air cannot be purified like this. Diseases spread fast through this medium. Therefore more attention should be given to the prevention of diseases in this direction which is possible by Aroma therapy.
4. It is an effective mass therapy. By injecting vapors of medicines in to air, many people can be simultaneously treated.

5. Very good treatment for the lungs, mind and certain glands.
6. Easy to treat, painless and safe. If the ill effects are observed, the treatment can be stopped immediately.
7. The medicines are cheap as they can be naturally obtained.

Aromatherapy awareness in ancient India :

Our forefathers were well aware of the bad effects of pollution and the remedy for the same in the form of aroma therapy. Atharva veda suggests the part played by the wind as a carrier of medicine as –

आ वात वाति भेषजं विवात वाहि यद्रपः
त्वं हि विश्वभेषज देवानां दूत ईयसे ।।

अ। वे। 4-13-3

[O wind, you carry and bring the medicine. You do away with illness. You are the doctor of the world. You move like the messenger of God]

The God, 'Vayu' answers to the prayer assuring to bring good health to the people in the next, 'Mantra' as

आ त्वागमं शांतातिभिर्यो अरिष्टातिभिः
दक्षं तु उग्रमाभिरिष्टं परायदमं सुवामि ते ।। (4-13-5)

[I came to you with good medicine which cure many diseases. I create tremendous energy in you. I cure all diseases]

The aroma which arises from the 'यज्ञकुण्ड' was supposed to cure many diseases. There is a reference for this fact in the same veda as –

अजशृग्यज रक्षः सर्वान् गन्धेन नाशय ।

अ। वे। 4 - 32

The wind is supposed to have both बलसंवर्धन and दोषनिवर्ण as in the case of plants quoted earlier in this article. It is suggested as,

द्राविमौ वातौ वात आ सिन्धोरा परावतः ।

दक्षं ते अन्य आवातु अन्यो वातु यद्रपः ।।

[Two winds blow, one over the river and other over the mountains. The first brings energy and the second cures diseases]

The wind over the water brings rain and hence responsible for energy. The other wind blows over the mountains which is full of medicinal herbs. This is a clear indication of the awareness of aroma therapy among ancients.

The importance of pollutionfree atmosphere was well known to them. They knew that the health is the real wealth. The illness is worse than the enemy, 'शत्रोरपि पिविष्यते व्याधिः' says, 'चाणक्यनीतिसूत्रम्'. The 56th subchapter of 57th chapter of अर्थशास्त्र explains the punishments to be given to the persons who put garbage on the roads, who throw the dead bodies of the animals in public places and who pass urine, stools in such places. Carrying the dead body on certain roads was also prohibited. The dead bodies were sprinkled with certain lotions to preserve it for sometime. It had to be cremated only outside the village or town. All these precautions were to avoid pollution which was a part of aroma therapy.

'Vanaprasthashrama' is the phase of life adopted by people in old age. In this ashrama, people were residing in forest after completing the duties of 'गृहस्थाश्रम'. This change of lifestyle was also according to health rules followed by aroma therapy. In the old age, body resistance towards

The Nobel Prize in Physiology or Medicine for 2004

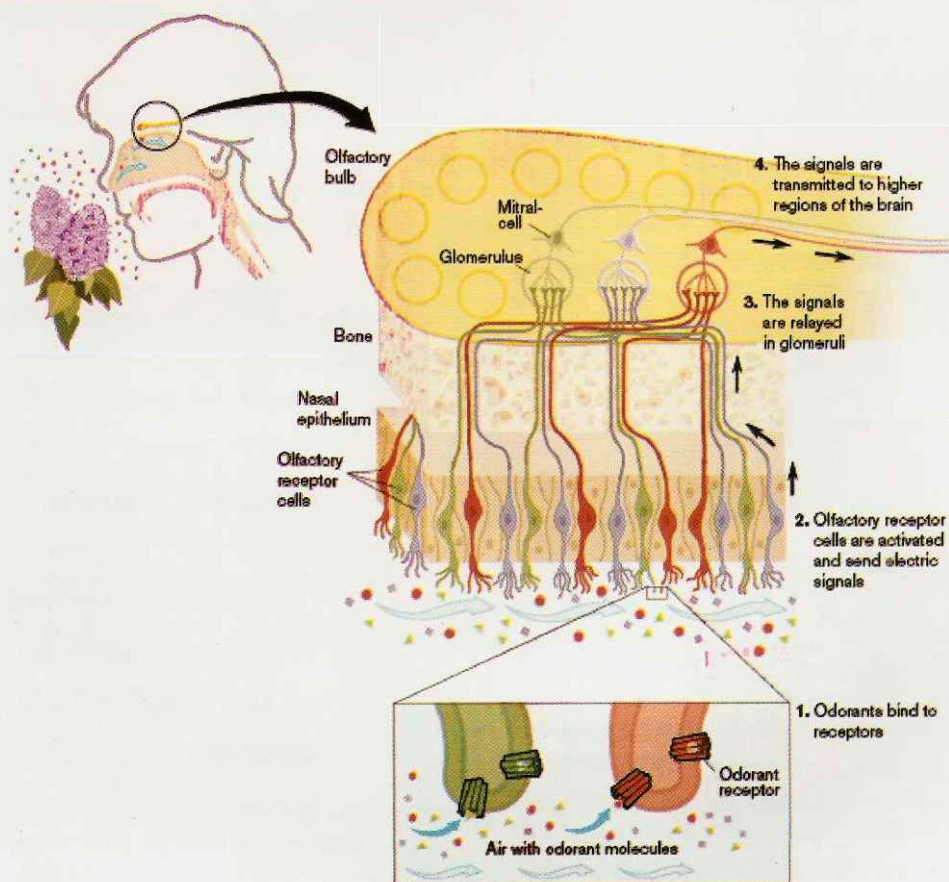
was awarded jointly to

Richard Axel and Linda B. Buck

for their discoveries of

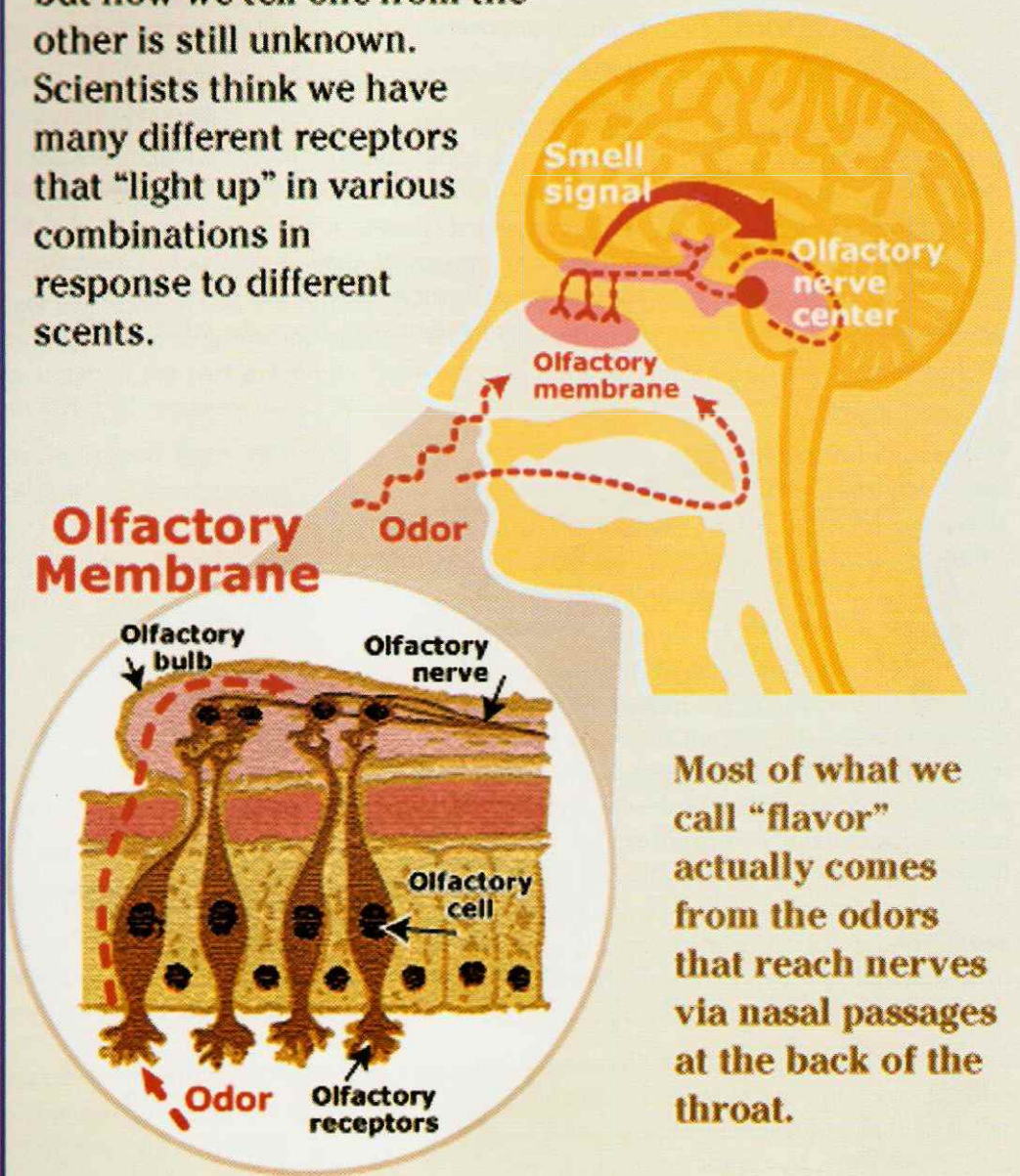
“odorant receptors and the organization of the olfactory system”

The sense of smell long remained the most enigmatic of our senses. The basic principles for recognizing and remembering about 10,000 different odours were not understood. A series of pioneering studies clarified how our olfactory system works. They discovered a large gene family, comprised of some 1,000 different genes (three per cent of our genes) that give rise to an equivalent number of olfactory receptor types. These receptors are located on the olfactory receptor cells, which occupy a small area in the upper part of the nasal epithelium and detect the inhaled odorant molecules.



We can detect around 10,000 odors, but how we tell one from the other is still unknown. Scientists think we have many different receptors that “light up” in various combinations in response to different scents.

Olfactory Membrane



Most of what we call “flavor” actually comes from the odors that reach nerves via nasal passages at the back of the throat.

diseases will be decreasing. The life in the forest provides the pollutionfree atmosphere. Further, the forest is full of medicinal herbs. Continuous exposure to aroma of such herbs, keeps the body away from diseases.

Role of flowers in aromatherapy:-

Flowers play a very important role in aroma therapy. Though several parts of the plants are aromatic in nature, the property is prominent in flowers. Added to the fragrance, they have beautiful shape and colours with nector in their heart. The bees buzz round the flowers which is pleasing to ears. Kalidasa describes 'कुरवक' flower as

मधुलिहां मधुदानविशारदाः। कुरवकाः रवकारणतां ययु
(रघु 9-29).

They are soft to touch. Thus they can appease all the five sense organs. By these, they can produce a soothing effect on human mind which in turn promotes health of the body.

Of the above said qualities of the flowers, the aroma is praised most. A 'subhashita' quotes that,

रूपयौवनसंपन्ना विशालकुलसंभवाः ।
विद्याहीना न शोभन्ते निर्गन्धा किंशुका इव ।।

Kalidas in his 'Kumarasambhava' also comments about odourless flowers.

वर्णप्रकर्षं सति कर्णिकारं दुनोति निर्गन्धतया स्म चेत्
कु। (सं 3-8)

(Though has beautiful colours, odourlessness of 'कर्णिकार' flowers pains the heart)

Similarly we find many references to the fragrant flowers in the literature as

वनेषु सायन्तनमल्लिकानां विजृम्भणोद्गन्धिषु कुड्मलेषु
(रघु - 16-47)

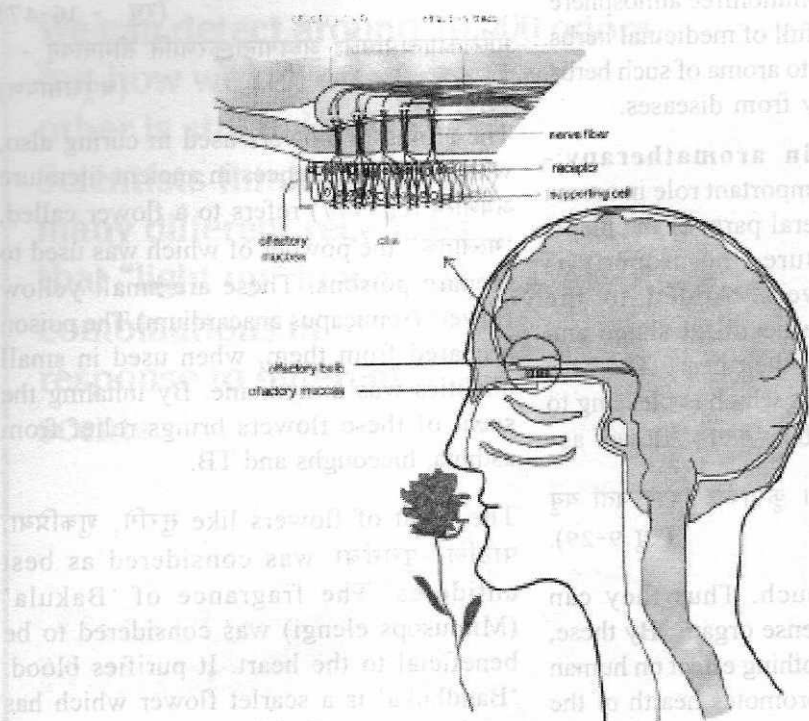
मल्लिकागन्धमांसलैः अध्वगान्तःकरणानि सीमन्तयन् -
(चंपूरामायण)

The aroma of flowers used in curing also, which finds references in ancient literature अर्थशास्त्र (ch. 777) refers to a flower called, 'भल्लातक', the powder of which was used to prepare poisons. These are small yellow flowers (semicarpus anacardium) The poison prepared from them, when used in small quantities was a medicine. By inhaling the scent of these flowers brings relief from asthma, hiccoughs and TB.

The scent of flowers like सुरगि, शुक्रप्रिया, पाटलि, पुनर्नवा was considered as best antidotes. The fragrance of 'Bakula' (Mimusops elengi) was considered to be beneficial to the heart. It purifies blood. 'Bandhuka' is a scarlet flower which has another name, 'Bandhujeeva' meaning of which is 'a friend of life'. It was supposed to give relief for some eye diseases.

Who has not heard about 'champak'. These flowers are referred to as having intense fragrance (अतिगन्धकंमाः). This odour activates sexual organs. Bhavaprakasha quotes, (चंपकं वातपित्तघ्नं गुरुवीर्यकरं तथा) A continuous exposure to this odour may bring headache.

The soft odour of 'Parijatha' apeaces the mind. It produces a soothing effect in patients of mental illness. This may be the reason for its place as divine tree. The fragrance of Bilva and lotus purifies breath. So many such references are found in the treatises of Charaka, Susruta and Vagbhata (chapters C. S 27, 154, S.S 46)



It is well known that Eyes respond to electromagnetic spectrums and ear responds to vibrational spectrum but how the nose responds to chemical spectrum is not yet fully understood. Old traditions using scented flowers, sandal pastes, etc show that fragrance helps many people enjoy their lives. It really acts like beautiful colour and music as the sensory phenomenon of the nose. In a romantic situation the reactions to fragrance could be psychological. This may be a conditioned response but definitely it is an organic response.

Extensive research has been conducted as reaction to fragrance and aroma therapy. Even at very small dose the fragrance molecules can stimulate the body in a olfactory system. There is a strong link between the sense of smell and emotion. This may be due to the proximity of the olfactory bulb to the limbic system, which is considered as "Emotion centres". The nasal passage offers a unique route of exposure for chemicals. This is directly taken to the brain because of the proximity of this system. The olfactory and limbic tract are the most direct connection between the brain and the air we breath. There is no blood-brain barrier, so the reaction to the organic or biochemical compound with brain centres is quicker. If the real scientific details of science of smell is understood the aromatherapy at a nanotechnology level may be the future medication system.

We can now collect the common features of flowers which leads to natural aroma therapy.

1. Flowers are best for aromatherapy in the natural way.
2. It can satisfy all the sense organs and brings peace of mind which naturally cures many diseases. A disturbed mind is the root cause of illness.

चितायाश्च चिन्तायाश्च बिन्दुमात्रविशेषणम्

3. Flower bloom in mornings and in the evenings. A walk in the flower garden in these hours improves the health radically.
4. The flowers need not be smashed for medicine. They send their fragrance through air to us

“उपययौ विदधन्नवमल्लिकाः शुचिरसौ
चिरसौरभसंपदः”

(माघ 6-

22)

They can spread fragrance from distant islands, says kalidasa.

द्वीपान्तरानीतलवंगपुष्पैरपाकृतस्वेदलवा मरुद्धिः

(रघु 6-57)

Incense (Dhupa) treatment: Apart from the naturopathy of flower fragrance, the dried and powdered parts of the plants can be burnt and the smoke raising can be inhaled which gives fast relief. Arthashastra refers to method in which a type of grass called ‘kodrava’ (कोद्रव) mixed with the powdered karnikara flower is burnt and the smoke is injected to the atmosphere. This

sterilizes the atmosphere. (प्रकरण 177 of अर्थशास्त्र)

The method of inhaling the medicine was in wide practice. A herb called ‘nagadali’ was usually kept under the pillow of children. The same was burnt and smoke inhaled cures cold and cough. The powder samrani (साम्राणि) was used to dry the hair which was found to be beneficial to remove head louse. Certain insense was widely in use in curing mental disorders.

The ‘Aromatherapy’ is both soft and strong. It can be used as a primitive as well as curative therapy by proper understanding and use of this therapy, one can be healthy and happy. It is a ready medicine (सिद्धं पीत्वा श्वयक्षीणो निव्याधिर्भाति देववत् - चक्रद). It is like a doctor coming to us for regular check up. (अहं भेषजं समु जग्रहम् - अथर्व) our forefathers knew the value of this natural gift. There were well maintained flower gardens (पुष्पोद्यानं) in every town. Every sacrifice (याग) was for the welfare of the world in which medicinal plants and other things were burnt and smoke was injected to the atmosphere. The flowers were abundantly used in pooja, the fragrance which could be inhaled by everyone which was nothing but aroma therapy. I have seen instances of chronic diseases removed by mandala pooja. Men and women were decorating the hair with flowers. Thus continuously they were under the aroma therapy and lived for long years.

जीवेम शरदः शतम्, मोदाम शरदः शतम् ।

TREE AND PLANT PRODUCTS UTILIZED FOR THE CARE OF PREGNANT WOMAN AND CHILDREN

Dr. Rohini, D. Bharadwaj, M.D. (AY)

Paper presented at the Seminar on "Trees and plants associated with the Rituals & their impact on the health" on 8th, 9th and 10th May 2004

Chemical and synthetic drugs are freely and irrationally used by the general public causing so many known and unknown side effects. There may be different practices and formulations in different parts of the country. The contents of this paper are chiefly based on Ayurvedic texts and the practices prevalent in the coastal Karnataka.

The relation between plants and human beings is very intimate and intricate. It is not only nutritional and medicinal but also emotional and spiritual. As an Ayurvedic Physician, I limit myself to the first two aspects of plant products.

The products of plants can be available in the following forms – Moola (root), Kanda (tuber), Twak (bark), Sara (heart wood), Patra (Leaf), Pushpa (flower), Phala (fruit), Beeja (Seed), Nirryasa (Resin, gum), and Ksheera (Latex). These are used in various forms as Swarasa (expressed juice), Kalka (Paste), Churna (Powder), Kwatha popularly called as Kashaya (decoction), Hima (cold infusion), Phanta (hot infusion), Vati (pills), Siddha Ghrita (medicated ghee), Siddha taila (Medicated oil), Avaleha (Solidified extracts with honey and ghee mostly sweet in taste), Asava (fermented medicine) and so many others. Many dietetic preparations contain the medicinal herbs and are called as Oushadha, Siddha Yavagu and Yoosha [Medicated gruels and soups],

among these, those plants and types of preparation which are mild, nourishing and cooling are more suitable for the care of pregnant woman and the infant. The plants that are chosen for their care are mostly included under Jeevaniya, Brahnaneeya, Stanyajanana, Stanya shodhana, Prajasthapana, Samjnasthapana and Vayasthapana, Mahakashaya in Charaka Samhita Sutra 4th chapter and under Kakolyadi, Vacha Haridradi, Vidari gandhadi and Mustadi gana in Sutrasthana Sushruta Samhita. The preparations which are most suitable for the pregnant woman are Kwatha, Avaleha, Churna, Sharkara (Syrup), Panaka (juices), Ksheerapaka (Decoction prepared with milk), Ghrita paka & Taila paka among the medicinal preparations and Peya and Yavagu (Thin and thick gruel) among dietary preparations. For the infant, the medicines are given in the form of Kalka, Churna, Ksheerapaka, Ghritapaka & Tailapaka, Kwatha and Dhoopa.

The Regimen prescribed for the normal healthy woman after conception to the time of delivery is called as 'Garbhini Charya'. It not only protects her from physical and mental disturbances but also aims at the all round development of the child. It also enables her to successfully undergo delivery. The regimen includes in short, food and habits which are satvik in nature. Food has to be rasya (juicy) Snigdha (fatty) Sthira

(stable) hrudya (pleasing) and habits which keep her mind composed and happy. The most suitable cereal is rice specially shashtika shali (paddy grown in 60 days) because it is satmya (accustomed), sweet in taste, nutritive and easy for digestion. More over it is most suitable for the preparation of Yavagu and Peya. Among pulses, mudga (green gram) is suitable for the same reasons. Fruits and vegetables which are cooling and nutritive like draksha (grape), Amra, Mathulunga (citrus medica) dadima (pomogranate), Amalaka (gooseberry), Nimbu (Lemon) are accepted. In coastal parts dietary preparation called "Tambuli" prepared with the tender leaves of herbs such as Brahmi, Mandookaparni, Guava, Pomogranate, Punarnava, Flowers of ixoria, Ksheerini etc along with fresh butter milk and gratings of fresh coconut is ground to a fine paste and eaten, which is a coolant and nourishing dish.

In the early part of pregnancy lot of cool milk (Anupa Samskrita – non-processed) is to be given in small quantities frequently.

Later on the 2nd and third month she can take jeevaneeya gana siddha Ksheera-milk decoction prepared with plants like jeevanti, guduchi, shatavari, yashtimadhu, ashwagandha, Sariva etc. She can also take a mixture of powders of shatavari, ashwagandha and amalaki 2-3 grams mixed with honey and followed by milk.

In the sixth month ghee medicated with the above drugs is prescribed about 2 tsp followed by warm milk.

In the seventh month ghee medicated with the five drugs, shala parni, prushni parni, Kantakari, Brihati and Gokshura, or just

Gokshura ghrita is to be taken. If the woman has aversion to ghee, she can take gokshura, fruit or entire plant in the form of powder mixed with sugar or honey and followed by milk. This can be continued till delivery.

The powder of the root of jatamamri about 1 gm is given with cold water or milk, if there is loss of sleep or anxiety.

Apart from these above classical formulae, there is a practice of giving shatavirtita Ksheerabala taila about 5 drops with either warm milk or jeeraka kashaya, which acts as a nervine tonic and pacifies the common bodyaches and also reduces the distention of abdomen by regulating the intestinal movements.

Some people advice the woman to take Kumkuma Kesara – a pinch with warm milk and believe that it improves the complexion of the child.

CHILD CARE

Routine regimen

Jata Karma : Immediately after birth the baby is cleaned. The oral cavity should be smeared with ghee and saindhava lavana to remove the phlegm and other ingested material. Then herbs like Vachan, Brahmi, Amalaki or shankhapushpi are pasted on a clean flat stone. This paste about 50-100 mg is given with honey and ghee to the child. Preferably gold is also triturated with it. For this purpose 24 ct gold wire is taken and rubbed with little pressure to mark two lines of 1 inch over the stone. These lines are washed with pure water and fed to the child.

Abhyanga Snana – Dhoopana

From the first day itself oil's like Bala taila are applied with delicate pressure to the baby and bath is given with warm water pre-boiled with neem or nirgundi leave. During bath Bengal gram flour with haridra choorna mixed with milk can be used. Cotton soaked in oil should be kept over the bregma (pichu or moordha taila).

Dhopena (fumigation) is also done to the whole body of the baby with Rakshoghna drugs twice a day.

Soothika agara. Puerpural room

The room in which the delivered woman and baby are kept, should be kept clean and warm. It should be twice fumigated with Rakshoghna dravya (protecting materials) like tila, atasi, pippali, guggulu, sarshapa, vidanga, kushta, lashuna, haridra etc. The tender branches of badara and nimba can be used as fans inside the room. The same rakshoghna dravya are tied in a small piece of cloth, and then tied to limbs or neck of the baby. This practice is believed to protect the child from bad effects of spirits.

Shishu ahara – Food for infant

Breast milk is the best food for the baby. If it is scanty the following plant products can be used to increase it. Decoctions of milk are usually preferred.

- Shatavari
- Jeevanti
- Ashwagandha
- Vidari Kanda
- Sariva and Ushira
- Ksheeri Vruksha barks

- The woman should be given lashuna and palandu (Garlic and onion) along with food.
- Preparations like sowbhagya shunthi. Paka or shatavari rasayana -1/2 to 1 tsp followed by milk.

If the child has to be fed with cow's milk, it is better to give it after boiling with vidanga seeds or with prushni parni, added with sugar. As a substitute, decoction prepared with the bark of a plant called Bandanaru is given with sugar and little milk.

As a supplement to mother's milk after 3 months, starch extracted from the tubers of arrow root plant can be given after cooking with milk and mixed with little jaggery. After six months the ceremony of Annaprashana is conducted and the infant is slowly made accustomed to the regular food.

Janma ghuti

After tenth day of birth and upto one or two years the infant is given the paste of certain herbs mixed with breast milk and honey. It is popularly called as ghuti and it keeps the child fit by warding off minor and common ailments. It also provides and improves the immune power and enhances the mental powers. The list of drugs used differs slightly in various parts of the country, and one set is given below.

- Vacha, Haridra, Hareetaki, Bala hareetaki, Amalaki, Jatiphala, Dry Kharjura and its seed and shunthi.

These drugs are rubbed with light pressure over a stone slab of 4" diameter for 1-6 times each along with mothers milk and fed to the child. The proportion of each drug in

the combination differs depending on the condition of the baby on each day. There is a practice of adding almond also in case of malnourished children.

Medhya rasayana (Intellect promoting drugs)

- Juice of 5-10 leaves of Brahmi or mandooka parni mixed with honey and given after 6 months to 2 years.
- Jyotishmati taila – 1-2 drops once a day with milk.
- Powders of Brahmi, Vacha, Shankhapushpi and Yashtimadhu 250 mg to 1 gm with honey.
- A small 24 ct gold wire is inserted into 1" long piece of Vacha root. This is rubbed on stone with breast milk about 2-6 times and fed to the child.

General anabolic agents (Brahmaneeya drugs)

- Powder of Bala, Shatavari and Ashwagandha about 1 gm given with sugar and milk.
- Ksheerapaka of Krishna Musali and Musta.
- Powder of root of Bala and Atibala with milk

Useful plant products for few common complaints of the child

It is a general rule to give the medicine to the mother if the infant is dependent on mother's milk only. In case of little grown up child the medicine is given to the child.

1. Rashes on the face

- Paste of chandana with milk.

- Small coconut fruits in early stages wither away on their own. Their basal parts are rubbed into a paste and applied.

- Ashoka flower ground to fine paste, are heated with coconut milk. The oil extracted is used internally and as application. If the child is very small then mother has to drink the oil in the dose of 1-2 tsp.

2. Jwara – Fever

- 50-100 mg of katuki mixed with honey
- Water boiled with musta, parpata, Udichya, Usheera, chandana and shunthi (Shadanga Paneeya Hexadrink))
- Hot infusion prepared with Tulasi, black pepper, lavanga and shunthi given in dose of 2-5 tsp 3-4 times a day.
- Decoction of decoctives like Nimbadi choorna are inserted into tender coconuts which are sealed and heated either in hot water bath or in the hot ash. The water then is filtered and given to the child, which is claimed to be very effective. This process is called as karikku puzhugan.
- Fumigation with neem leaves, white mustard & honey

3. Kasa – Pratishyaya – Cough and cold

- ¼ - 1 tsp of Tulasi juice with honey.
- Juice of parna yavani (Dodda patre) extracted after steaming the leaves is given with honey or sugar. In the same dose.

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INSECTS AND PLANTS : MUTUAL INTERACTIONS

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Introduction

Humans have always been fascinated by insects and a majority of their observations occur on the substrate of plants. Insects and plants have evolved together for millions of years. One of the oldest and most highly developed and fascinating associations in biology is that between insect pollinators and flowering plants. Without these relationships, the basic quality of our environment and lives would be greatly altered. There are a number of reasons for this :

1. Insects and plants together are three fourths of the known species on earth and insects that fed on plants represent one-fourth of life on earth.
2. Insects and plants have evolved in response to each other and scientists are curious to know how these relationships developed.
3. Insects came on the scene of existence some 250 to 500 million years ago, while man entered the scene only about one million years back.
4. The number of species of insects has been greater than the total number of species of all other forms of life put together.

Examples of coevolved relationships revealed that species or guilds coevolved to

the extent that they benefit one another, the presence of both, enhances the reproductive success of both. This is called mutualism. Plant pollination by insects is a co evolutionary process that has been on-going for over 250 million years. Fossil records show that winged insects were abundant in the carboniferous period, long before any flower like structures were present. The earliest flowering plants were probably fertilized by light weight, wind-borne pollen. Early insect pollination was undoubtedly accidental.

Since plant directed vectors were much more efficient than the randomly directed wind, there must have been enormous selective pressure on plants towards the development of new and more effective pollinating mechanisms. An early step in this direction was the development of sticky pollen grains that adhered to the insects and thus would have been carried more readily on the insects bodies to other flowers where some would have been transferred to the sticky or feathery stigmas of those flowers. Insect would also find this sticky pollen more accessible as a food source. The flowers eventually began to secrete small amounts of sweet fluid (nectar) and thus floral visitation by insects was more encouraged. With time, the flowers acquired colors that made them stand out from the green plant and allowed them to be more easily seen by insects. Specialised floral

patterns called nectar guides appear to be used by insects in locating the nectar source. Ultraviolet nectar guides are quite common and are probably more common and important in encouraging flower visitation by insects.

Another effect of coevolution is the flower constancy exhibited by some pollinators. Where flower constancy is high, the pollinator restricts foraging to one plant species during single trips or for longer periods. The constancy of a bee is estimated by examining the types of pollen on the bees body after a foraging trip and such studies reveal an amazing fidelity for several bee groups. Not only do individual bees work the same flower species on separate trips, but entire bee colonies may work one flower species for 10 to 11 days until the source is depleted. Such constancy influence plant species composition.

An aggressive stinging ant, *Pseudomyrmex ferrugineus* nests in the hollow thorns of the bull's horn *Acacia* (*Acacia cormigera*) and feeds on nutrient rich beltian bodies and sugar secretions from extra floral nectarines. In return, ants attack herbivores and clear vegetation surrounding their *Acacia* tree. *Acacias* without ants have lower growth rates and are often killed by herbivores, fire or crowding from other plants (Janzen, 1966). The mutualism here is obligate, neither the ant nor the *Acacia* survives without the other.

More common mutualism is between plants with extra floral nectarines and the ant species that seek nectar. While searching for nectarines, ants prey upon herbivores they encounter. Plants have a mutualistic relationship with many ants for seed

dispersal. There are two major variations in this phenomenon; some ants feed upon the seeds (so plants dispersal depends upon the frequency of seeds dropped) and some ants feed upon an elaisomes (fat body) that is attached to a seed, thereby ignoring the seed which is left to germinate (Handel and Beattie, 1990). This latter relationship (mymecochory) insures complete dispersal of all the seeds. The morphologically and taxonomically diverse origins of elaisomes indicate convergent evolution : originally they protected seeds from predation but gradually changed into food lures for ants. The biochemical attractants contained within the elaisomes have been identified with some proving the same from different continents! Other ants have special relationships with plants whereby they cultivate fungal gardens (providing nutrients for ants) in exchange for shelter and a supply of plant material that ants harvest.

The Yucca Moth :

A famous example of obligate symbiosis is between Spanish dagger or Yucca plant and the yucca moth. In the east of the Rocky mountains of America, Yucca is pollinated exclusively by *Tegeticula yuccasella*. The only food of the larva of this moth is provided by the yucca ovules, which grow abnormally large in the neighbourhood of the moths egg. Pollination of flowers by the moth is necessary for survival of the larvae. Pollination by casual insect visitors does not occur. Through evolution, the mouth parts of the moth have been greatly modified into curved tentacles that cannot be used to feed on either the plants pollen or its nectar. The adults do not feed and live only for a short time. The tentacles of moth are used to collect the sticky pollen from the anthers of

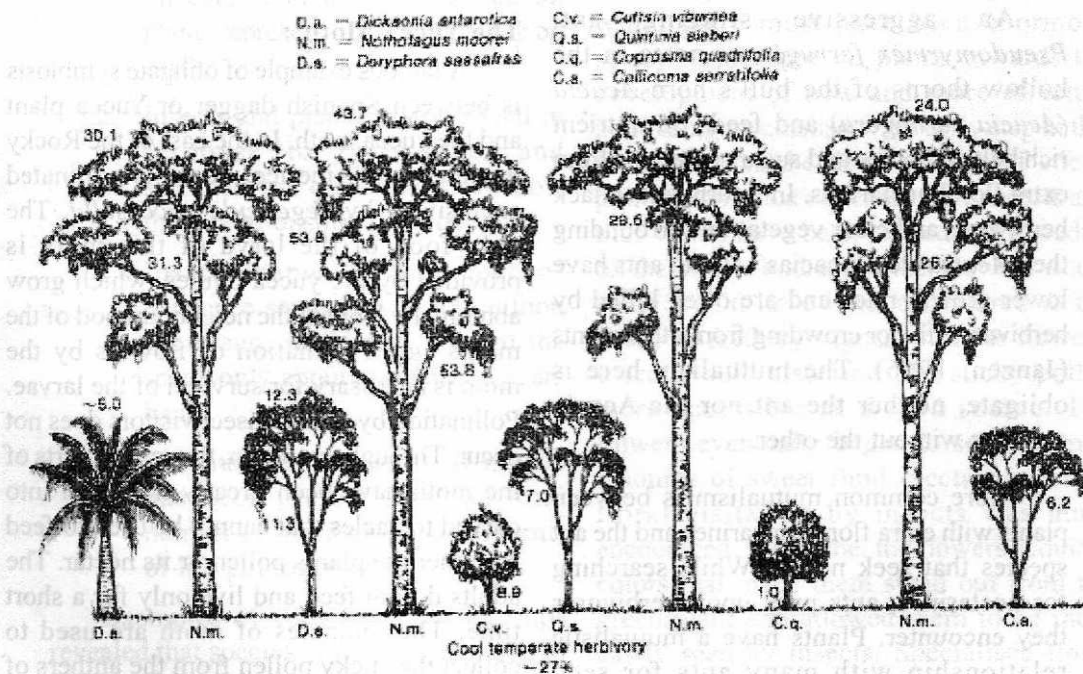
a yucca flower and to form it into a ball. The female moth holds this under her head with the tentacles and from legs and carries the pollen ball to a second flower. There she examines the plant ovary and if it is suitable, bores into it with her ovipositor and lays an egg. She then climbs up the vaselike style and thrusts some pollen down the tube, thus pollinating the flower. This process is repeated several times. Since the moth usually moves to a second plant before applying the pollen, greater genetic diversity is ensured for the yucca plant through cross pollination.

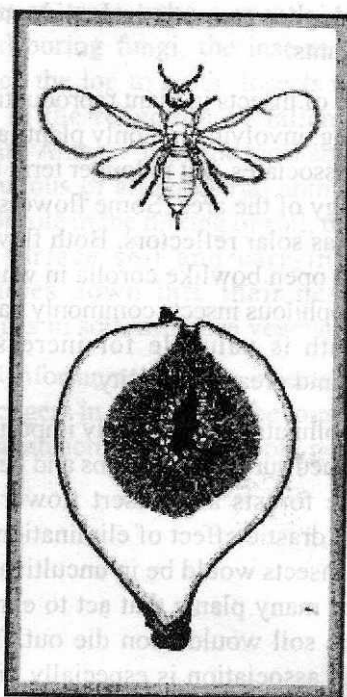
Fig - Wasp :

Another interesting family is the Figs with 600 species, each of which has a specialized pollinator. Pollinators that visit only one taxon of plant and termed monoleptic. What is the evolutionary

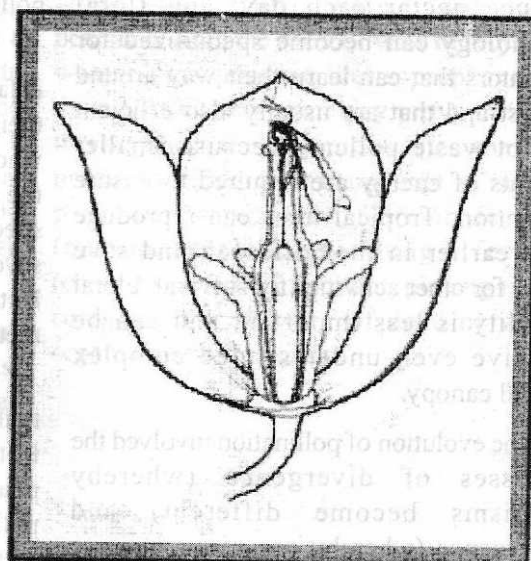
advantage? Fig wasps not only pollinate the flowers but also lay eggs in the floral receptacle called a synconium. This structure provides a safe home for the wasp larva, which consumes the ovule in which it is placed. Upon emergence it can easily find a mate and fly to another ripe fruit, there by completing its life cycle within one tree canopy. So monoleptic behaviour effects a secure existence to the host specific fig wasp.

Even the foraging dynamics of pollinators can be a complex coevolved process. For example, euglossine bees forage for food throughout kilometers of tropical forest and frequently return to the same plants. This trap lining behaviour is advantageous because out crossing occurs despite the very low plant densities characteristic of many tropical tree species.

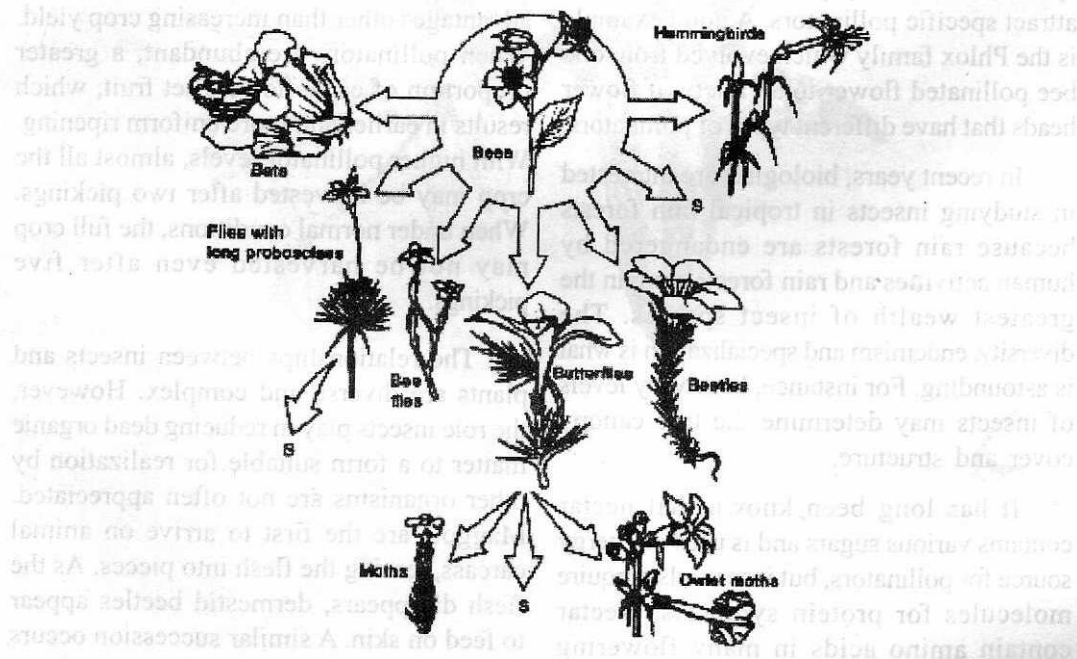




Schematic drawing of a fig inflorescence, with a female fig wasp at the entrance. An enlarged drawing of the female wasp is shown at the top. (Drawing by Peter Eades.)



Cross section of a yucca blossom, showing a female pronuba moth stuffing a mass of pollen (gathered from another blossom) down the style. (Drawing by Peter Eades.)



Only one of the several flowers must produce nectar each day, and floral morphology can become specialized for pollinators that can learn their way around a forest and that are usually also efficient (do not waste pollen). Because smaller amounts of energy are required to ensure pollination. Tropical trees can reproduce much earlier in their lifespan and save energy for other activities for survival. Floral visibility is less important and can be effective even under shaded complex tropical canopy.

The evolution of pollination involved the processes of divergence (whereby organisms become different) and convergence (whereby organisms become similar overtime). Fossil evidence indicates that animal mutualists changed more significantly over evolutionary time as compared to flowering plants. However, some plant families exhibit classic specialization of reproductive parts that attract specific pollinators. A good example is the Phlox family which evolved from one bee pollinated flower to a variety of flower heads that have different types of pollinators.

In recent years, biologists are interested in studying insects in tropical rain forests because rain forests are endangered by human activities and rain forests contain the greatest wealth of insect species. The diversity, endemism and specialization is what is astounding. For instance, herbivory levels of insects may determine the tree canopy cover and structure.

It has long been known that nectar contains various sugars and is used as energy source for pollinators, but insects also require molecules for protein synthesis. Nectar contain amino acids in many flowering

plants with higher amounts in Lepidoptera pollinated plants.

The role of insects in plant reproduction is far reaching, involving not only plants and their insect associates, but in longer term the whole ecology of the area. Some flowers of the arctic act as solar reflectors. Both flower species have open bowl-like corolla in which several anthophilous insects commonly bask. Extra warmth is valuable for increased metabolism and greater mobility.

Insect pollination is extremely important to the continued survival of shrubs and herbs in temperate forests and desert flowering plants. Most drastic effect of elimination of pollinating insects would be in uncultivated areas, where many plants that act to enrich and hold the soil would soon die out. The value of this association is especially great in arid regions, where even minor plant damage can cause serious soil erosion.

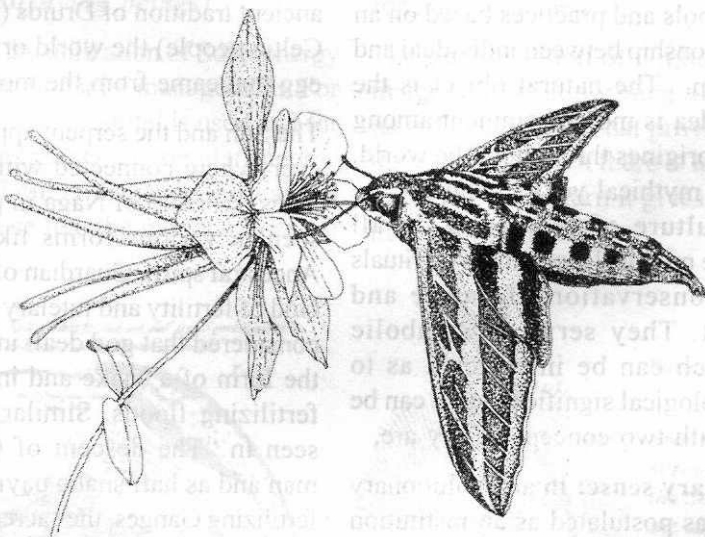
Insect pollination may provide advantages other than increasing crop yield. When pollinators are abundant, a greater proportion of early flowers set fruit, which results in earlier and more uniform ripening. With higher pollinator levels, almost all the crop may be harvested after two pickings. When under normal conditions, the full crop may not be harvested even after five pickings.

The relationships between insects and plants are diverse and complex. However, the role insects play in reducing dead organic matter to a form suitable for realization by other organisms are not often appreciated. Maggots are the first to arrive on animal carcass, tearing the flesh into pieces. As the flesh disappears, dermestid beetles appear to feed on skin. A similar succession occurs

in fallen trees, where greatly abetted by wood boring fungi, the insects ultimately reduce the log to earth. Insects also play a role in the reduction of fallen leaves to humus. Ants, perhaps the most abundant and ubiquitous of all terrestrial animals, play a major role in the mixing of soil, throwing up sub surface soil and carrying organic particles down into their nests. These changes in soil influence vegetation.

Unfortunately, some insects serving as scavengers in nature have become pests due to human activities. Household pests such as

Cockroaches formerly scavenged in nature, where their efforts were undoubtedly beneficial from the point of view of recycling wastes. It is possible that saprophages as dung beetles may some day prove of value in recycling the organic wastes that are produced in increasing amounts as human populations increase. Carrion feeders (necrophages) and dung feeders (coprophages) are important, playing major roles in the reduction of dead or waste organic matter to soil.



TOTEMISM AS A SYMBOL OF FERTILITY: A Comparative study

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"A worship of the powers of fertility which includes all plant and animal life is broad enough to be sound and healthy" says Jane Ellen Harrison. She adds "but as man's attention centres more and more on his own humanity such a worship is an obvious source of danger and disease"

Totemism is the systematic symbolization of social entities through concrete phenomenal images, often natural species and the development of these symbols into relationships of identity, power and common origin. Totemism is thus a complex system of ideas; symbols and practices based on an assumed relationship between individual and a social group. The natural object is the totem. This idea is more prominent among tribes and Aborigines throughout the world. Many appear mythical yet they signify the ideas and culture of the group. In all probability the mythical elements with rituals depict the conservation of nature and environment. They serve as symbolic devices, which can be interpreted as to reflect the ecological significance. It can be considered with two concepts. They are,

1. **Evolutionary sense:** In an evolutionary sense it was postulated as an institution of primitive thought. It was a necessary stage of religious concept, which all people have passed through cultural evolution.
2. **Systematic sense:** In the systematic sense a wide range of variance with culture specific symbolism can be seen.

A literature survey clearly shows that there is a psychic unity of mankind. This means that human culture was essentially universal having arisen everywhere through the same stages. Frazer Sir James George (1854-1941) has covered a wide area of anthropological research with myths & religion in his famous series of books *Golden Bough* (1890) in 13 volumes.

In mythology of different parts of the world serpent is linked to the origin of the world and to creation. It is the primordial material or the primordial being. According to the ancient tradition of Druids (priest among the Celtic people) the world originated from an egg that came from the mouth of a serpent.

The Sun and the serpent appear to have been everywhere connected with sea, rivers and lakes. Worship of Naga in particular can be seen in various forms like, Water spirit, Ancestral spirit, Guardian of hidden treasure, God of fertility and tutelary deity. Egyptians considered that god dealt in the river Nile in the form of a snake and incited the annual fertilizing floods. Similar concept can be seen in "The descent of Ganges" as half man and as half snake paying respect to the fertilizing Ganges, the sacred river of Hindus. Such a depiction can be seen in one of the sculptures in Mahabalipuram

Sun worship: The SUN and its energy is the main source of all life on the Earth. In *Adityahridayam*, sage Agastya describes to Rama the importance of sun,

एष ब्रह्मा च विष्णुश्च शिवस्कन्दः प्रजापतिः ।
महेन्द्रो धनदः कालो यमः सोमो ह्यपम् पतिः ।।
[He, the Sun is Brahma, the creator, Vishnu the protector, Shiva the destroyer, Skanda the warrior, Prajapathi the lord of creation, Indra the king of gods, Kubera the god of wealth, Kala the time spirit Yama the controller, Soma the moon god and Varuna the god of waters]

And hence,

वेदाश्च क्रतवाश्चैव क्रतूनाम् फलमेव च ।
यानि कृत्यानि लोकेषु सर्व एष रविः प्रभुः ।।
[He himself is the scriptures, as well as the sacrifices as also the fruit of sacrifices. He, the Sun god alone is the supreme controller of all activities, which are found in all living beings].

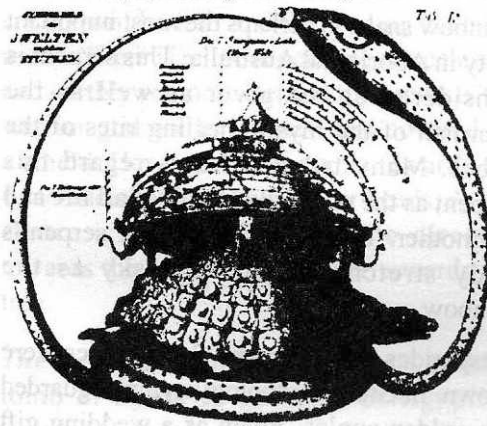
Let us compare the utilization of Solar energy to our day to day financial management. For large investments the Capital is used and for our periodical expenses the regular income is used. Fossil fuels are like the capital resources because like the monetary capital

accumulated over the years and generated through the savings the nature has created this over millions of years. Yet Sun is ready to impart his energy source forever to be utilised. What are we doing, the source is not being utilised properly and the capital is being continuously drawn without a proper planning. Who is responsible for this? Is it the philosophical thinking or the utilization and application of science for materialistic cause?

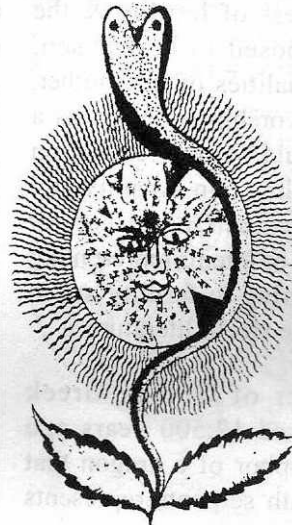
Renewable energy resources like Sun and water are like income resources as their supply is assured continuously in a certain regular pattern in the form of seasons. The supply of fossil fuel is limited but solar energy is unlimited and inexhaustible. It can also be replenished in our lifetime in the form of Bio-energy.

The representation of Oroboros that is the image of a snake forming a circle by biting its tail is a symbol that provides a vision of the world in which there is a union between Earth & Sky. In turn it gives the impression of a totality of Nature.

Die 24 Helden tragende Schildkröte, ruhend auf dem Symbol der Größe
Schäfer und die Kugel und der Weltkugel, nachher

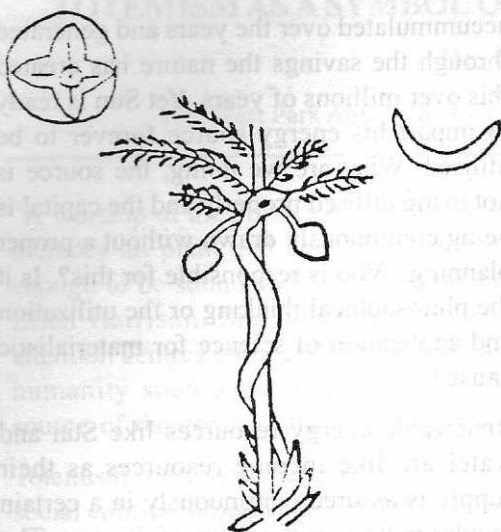


Oroboros concept



Surya Mandala.

A cobra with raised hood and two leaves that sprout from the tail of the Serpent symbolising the exploding energy of the Sun, water & life. (20 th Cent) [Drawn by a weaver in Varanasi]



The "world tree" where the snake as a guardian coils up the trunk of the tree. May be it is a warning aspect of protecting the vegetation. The moon shown possibly is a source of water. The figure given here is a pottery design of Elamite (A non-Aryan kingdom in Persian Gulf). This is exhibited in Art Museum (Louvre) in Paris belonging to Sassanian period, AD 211-651.

The one found in British Museum belonging to Sumerian seal of 2500 B.C depicts "The Goddess of the tree" Here it depicts two desirable fruits of the mythic date palm to be culled, the fruit of enlightenment & the fruit of immortal life. The female figure on the left in front of the serpent is supposed to be Gula-Bau. While the male on the right side is the lord of the tree of life. Gula-Bau of Sumeria can be equated with Greek goddess Demeter and Roman goddess Ceres both being the goddess of Agriculture



The Goddess of the tree Sumerian seal 2500 B.C.

From time immemorial the EARTH has been worshipped as goddess of fertility & the serpent who is supposed to be her son, endowed with the qualities of his mother. The primitive men worshipped Naga as a divine being who could bestow fertility on their crops by controlling rain. Anantha and Shesha are worshipped as God of harvest & cultivation. Images of totems representing snake and trees referring to fertility are in plenty through out the world literature.

Hermes (messenger of God in Greek mythology) who lived 12,500 years ago asserts that the metaphor of a dragon that could be equated with serpents represents

wisdom. His vision explains the first appeared dragon called Poimandres as an energetic consciousness of universal mind.

Rainbow snake is perhaps the most important deity in Aboriginal Australia. This serpent is considered as the giver as well as the guardian of the mystic healing rites of the tribes. Many tribal cultures regard this serpent as the primordial deity of all life and all mother. The notion is that the serpent's body stretches across the sky as the rainbow.

Hesperides is the garden where apples were grown. In Greek mythology nymphs guarded the golden apples given as a wedding gift



*The tree of the Hesperides
(Mythic tree of golden apples)*

by Gaea (Earth personified as goddess) to Hera, the queen of Zeus, the supreme deity of Greek. In the tree of Hesperides an immense horned snake coils up around the tree. From a hole in the earth at the root of the tree spring two waterspouts. The lovely nymphs are around attending the snake and the tree.

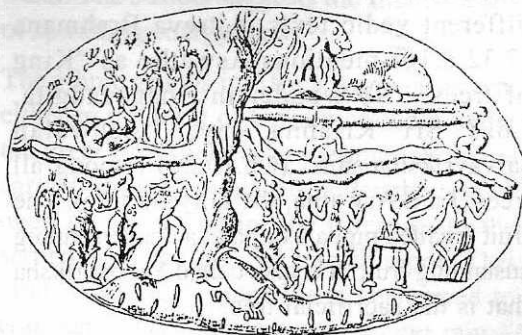
The Mycenaean seal ring showing the goddess of the early Garden of innocence with double axe and tree of life. On the top are shown the Sun and the waning crescent moon. There is a line separating the celestial and earthly regions. Behind the moon is the warrior god holding a staff and covered by a shield. Her right hand points towards the 6 sacrificial animals with their heads. At the centre is the double axe, one directed towards the sacrifice and other towards the tree.

The tree of Eternal life: In a large beehive tomb at Pylos (a gateway of Egyptian temple) a peasant found a ring of solid gold



*The goddess of the double axe
(Mycenaean seal ring)*

of 31.5 gms and was called "Signet ring of Nestor" (Nestor was a wise counselor in Greek mythology, who fought with Greeks at Troy). The picture on the ring depicts a big tree with spreading roots on the top on a mound or hillock. Its trunk is in the centre of the field. The whole emblem is supposed to represent the life hence called Tree of eternal life. This tree can be equated with the Scandinavian "Tree of the world". The whole picture if carefully observed could be described under 4 portions:



*The tree of Eternal Life "Signet ring of Nestor"
Mycenaean 1550-1500 B.C.*

Upper left: Minoan goddess seated conversing with an other idol. Above her are fluttering butterflies and pupa. Behind the goddess is a wedded pair.

Upper right: Sacred lion of the goddess resting on a bench supported by 2 human figures. Near the lion head, foliage are shown.

Lower left: The wedded pair of the upper left has reappeared and behind them are two young figures.

Lower right: Seated on a stool is a bird, behind which the Minoan goddess watching. In front of the seated bird are eagle headed figures. At the base on the mound are herbs sprouting and a dog like creature.

The entire scene depicts a lovely world of paradise with cyclical process of life. Probably the upper left depicting the heaven and rebirth. Lower left the mortal life, lower right the observation of the deeds by god and the upper right the protection of wild life.

मूलतो ब्रह्मरूपाय मध्यतो विष्णुरूपिणे ।

अग्रतः शिवरूपाय वृक्षराजाय ते नमः ॥

This is how *Ficus religiosa* (Aswatha or Arali) is described by Hindus. The mythical origin of this plant is described differently in different vedic texts. Aitreya Brahmana (7.32.8.16) mentions Aswatha as "King of trees". No wonder in Bhagavadgita, Lord Sri Krishna says "Ashwatah sarvavrikshanaam" (Ch.10:26) (among all trees, I am Aswatha, the holy fig tree). The fruit is called pippala or palaka phala meaning sustaining fruit. It is also called Yagnavriksha that is the sacrificial tree.

The Banyan, *Ficus indica* or *F.bengalensis* is called Vataavriksha. Its hanging roots and

spread branches that provide a thick shade has given the name Kshatriya among the plants. Since it grows in the reverse direction Nyag = reverse and Rohu= to grow, it is aptly given the name Nyagrodha. In Apasthambha Grihyasutra, a ritual is described as

न्यग्रोधस्य या प्रच्युदीषे वा शाखात्स्सवृषाणाम् ।
शुंगाआहृत्य सीमन्तवदग्नेरूपसमाधानादि ॥

(The expectant mother during 3rd or 4th month is given the juice of a raw nyagrodha fruit, grown between two leaves. The grinding of the fruit to be done by a young girl (kannika). This ritual called pumsavanamruktogarbheshyena is explained to be performed in Pushya Nakshatra only.)

In Mahabharata (Adiparva III: 186) sage Markandeya worshipped a child resting on the leaf of Banyan which showed him the entire Universe in its mouth

In mythologies and folk literature around the world man has designated trees with divine qualities. The veneration for trees as symbols of abstract qualities of wisdom and integrity had led him to call the tree by different names like,

Cosmic tree	Hungarian
World tree	Hindu & European
Yggdrasil	Scandinavian
Tree of the Universe	German
Tree of Life	China, Kien-luen
Holy tree	Fareast
Sacred tree	Mayan (American)
Tree of Knowledge	Biblical
Sun tree	Baltic
Healing tree	Australian
Celestial tree	Siberian

The ficus not only is a world tree but also is referred to as a magic tree. The very structure of the tree can be taken as a perfect analogy for a single source of life and its endless diversity. The trunk represents the single origin of all diversity, the roots deeply imbedded in the dark earth are symbolic of divine nutrients. Its multiplicity of branches spreading the central trunk represents the infinity of universal effects dependent upon a single cause. The world tree or called by any other above names represent many things. On one hand it represents the universe in continual regeneration, the continual spring of cosmic life and a reservoir. It also represents the sky or the heavens which are very important both as a tree of life and immortality. The tree totem appears in general to represent as the unit of consciousness. What ever may be the name given they all show a remarkably similar concept across a number of cultures. Possibly the ancient culture must have thought to describe the concept by a totem rather than an elaborate description by words in different languages.

In other words they made it more anthropomorphize (to place a thing in human terms) to communicate easily with common people. The tree with its vertical axis extends between Earth and Heaven. Added oracles, judgements or other prophetic activities were also performed at its base.

[Presently the tree is depicted more commonly in quest for romance where in movies the hero & heroine are shown singing under or around the tree].

The geographical depiction of the world tree include:

Celtic Druids & Christian	Oak tree, <i>Quercus rubra</i> (red)
	<i>Q. alba</i> (white)
Hindus	Peepal tree (<i>Ficus religiosa</i>) & Banyan (<i>F. indica</i>)
Ancient celts	Yew tree (<i>Taxus baccata</i>)
Nordic myth "Yggdrasil" <i>americana</i>)	Ash tree (<i>Fraxinus</i>)
Japan	Sakaki (<i>Cleyera japonica</i>)
German	Westphalia
Australia & Africa	Baobab

The depiction of Yggdrasil supports 9 spheres on its branches. This is supposed to be the interpretation of ancient Scandinavians. The 9 spheres represent the 9 planets of the Solar system. The rings are seen in a flat central area where a serpent chasing its own tail is shown. The spiralling energy shown as a serpent coiled around the trunk. The 3 roots suggests the smaller areas of spiralling energy flow.

The ethnic groups in Africa worship serpent either in the form of Python or cobra under the great Boabab tree. Sometimes an image carved in wood is placed under the tree or open pot is put where the offerings to the serpent god are poured into this pot. This kind of worship specially is performed to cure barrenness in women or to get rain.

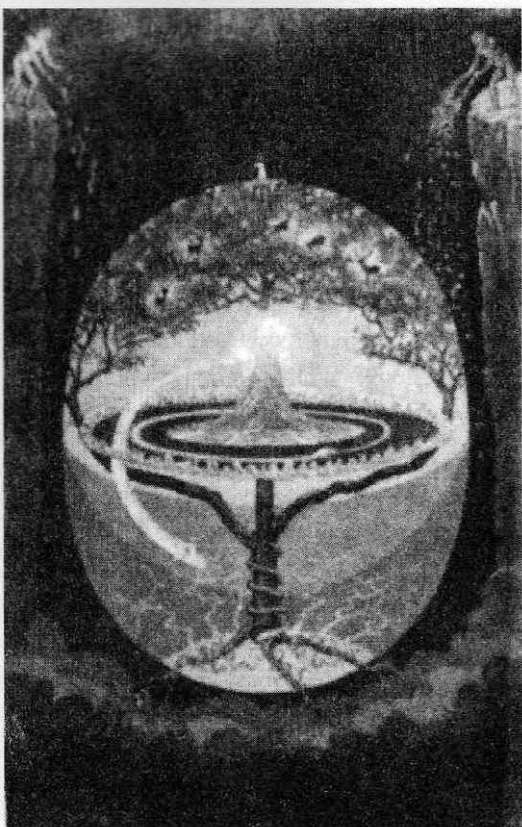


Fig. : "YGGDRASIL" – The World Tree
by Manly Palmer Hall

This serpent is called Pangol among the African tribes. During 1973 famine, this god was prayed and people believe that the rain was brought only after the prayers were offered. If a snake is dead the tribes of Africa even perform rituals and other formalities just like the Indians who follow similar rites on the death of a cobra.

Let me highlight the role of a change in the concentration of CO_2 for a short period in the Fig fruit (in real sense the flowers or inflorescence) and the thermoregulation in the sacred Lotus flower. In both these instance the fertility factor of the plant and the insects are being scientifically proved.

Galil, J. and D. Eisinkowitch in the year 1970 worked on the fig wasp, *Blastophaga quadraticeps* and *Ceratosolen arabicus* and their relationship with the entire life cycle of fig and the wasp. The stages involved in the development and procreation is wonderful bondage that exists between the two.

The winged female with her species-specific fig, attracted by chemical means pushes her way in to the young fig. In this act due to mechanical stress she may lose her wings and a portion of the antenna. All these are a part of the game to enter her labour ward. In this dark chamber the female flowers are mature and are ready to receive the pollen that the wasp has brought from the other flowers. But here the male flowers are still immature. Here the female wasp lays hundreds of eggs. The female flowers are

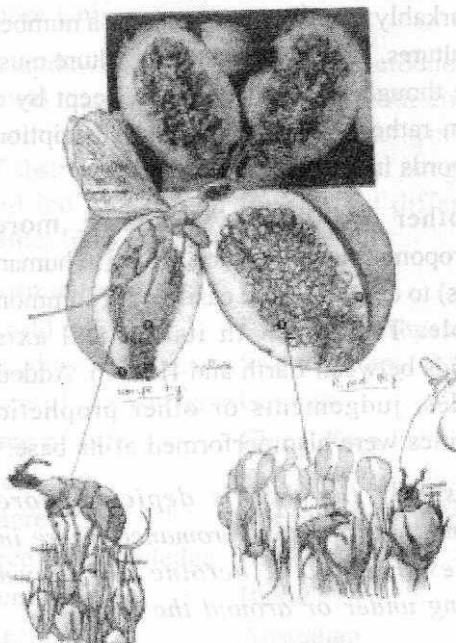


Fig and the Wasp

of two types, the short and long styles. She selects short styled for laying the eggs and the long styled are meant for the formation of seeds. The female wasp dies after laying her eggs. The eggs start hatching after a few weeks. First the male wingless wasp emerges and copulates with the females, which are still within the galls. After mating the males move towards the entry making a tunnel or a way but they die within this chamber. The females that emerge pass through the tunnel that the male has made. By this time the male flowers are mature which the female wasp carries the pollen from these flowers to be deposited in her next brooding chamber. Thus the wasp as a mother brings the pollen and as a daughter carries the pollen. The whole process and the cyclical behaviour of the two sexes of the flower and the wasp are under the control of the changes in the carbon-di-oxide concentration within the fig. Just two days before the opening of the male flowers the CO_2 concentration within the inflorescence increases 10%. This increase influences the male wasps to mate with the female. Then the concentration of CO_2 comes to the normal level when the female is ready to emerge and the male flowers are ready to donate the pollen.

Seymour R.S. & Paul Schultze-Motel have demonstrated the physiological adjustment of the Soldier beetle, *Chauliognathus marginatus* (Family: Cantheridae) which as a pair are held overnight inside the floral chamber of the sacred Lotus. It is their honeymoon and the next morning when the flower opens again the insects carry the pollen. The flowers of the sacred lotus, *Nelumbo nucifera* are thermogenic and thermoregulatory. Just like mammals despite

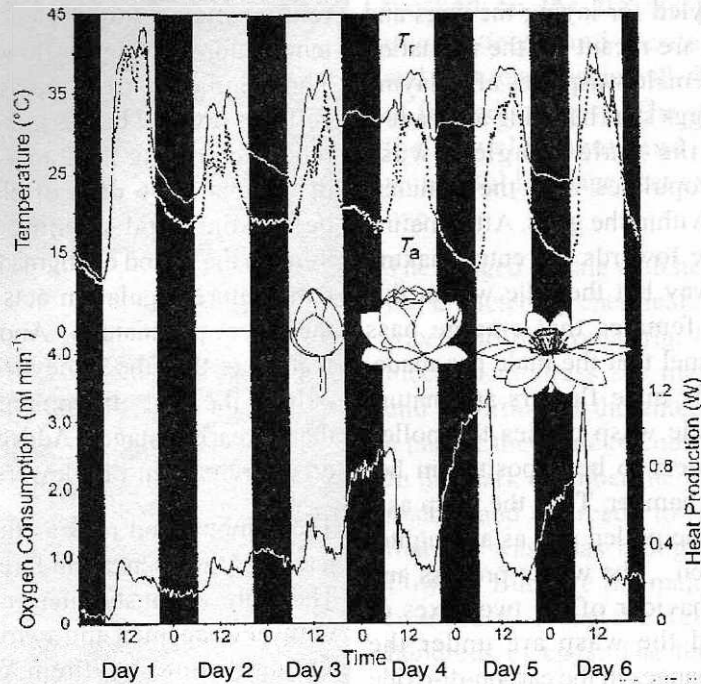
the fluctuations in environmental or ambient temperatures the flower regulates its temperature during its flowering sequence. The regulation of temperature occurs at cellular level. The period of temperature regulation during the 2 to 4 day period (out of the total 5 –6 days of blooming) begins before the petal opening and continues through the period of stigma receptivity. This temperature regulation acts as a reward to the insect pollinators. Another interesting feature is that the honeybees are attracted only to the post –thermoregulatory flowers than to earlier stages. Added they generally do not remain in the flowers over night.

The symbols and rites as they have sprung have lost their sense and force in due course. These are variously interpreted and applied with new cosmic and ecological themes. Though some of them can hardly be accepted in this world of Science and Technology, the real essence with reference to the concern and reverence to nature cannot be ruled out.

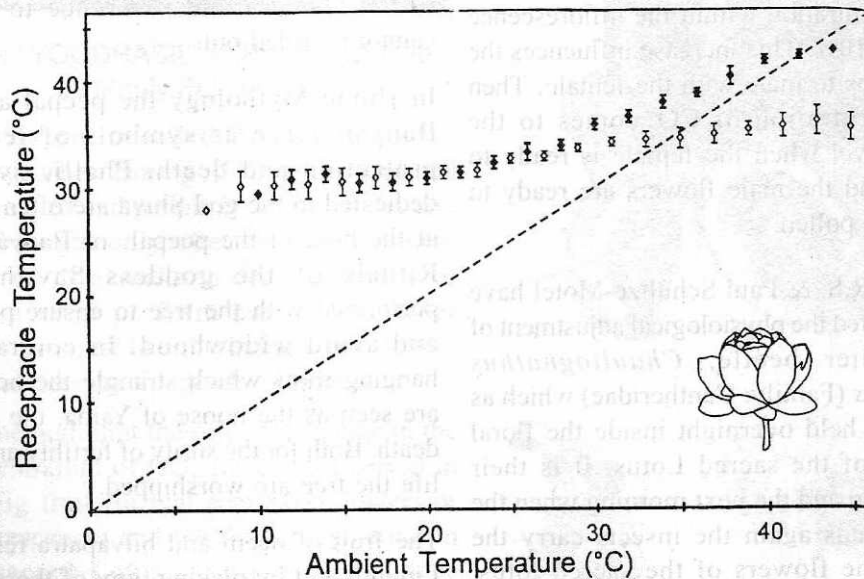
In Hindu Mythology the peepal and the Banyan serve as symbols of fertility, protection and death. Phallic symbols dedicated to the god Shiva are often placed at the base of the peepal or Banyan tree. Rituals of the goddess Savithri are performed with the tree to ensure progeny and avoid widowhood. In contrast the hanging roots which strangle the host tree are seen as the noose of Yama, the god of death. Both for the surity of fertility and long life the tree are worshipped.

The fruit of neem and bilvapatra resemble Lingum and by placing any of these fruits on the leaf of a peepal that resembles Yoni, says Capt. J.S.F.Mackenzie, (Mairur

Ambient Temperature



The stages of flowering against temperature and oxygen consumption



Changes of ambient temperature against receptacle temperature during the flowering in Lotus. When the flower acts as a thermoregulator the changes in ambient temperature does not bring any change in receptacular temperature. Hence maintains homeostasis.

Commission in his article "Tree and serpent worship") as a representation of an entire sex concept, namely Yoni and linga.

ऊर्ध्वमूलमधः शाखमश्वत्थं प्राहुरव्ययम् ।

छंदांसि यस्य पर्णानि यस्तं वेद स वेदवित् ।।

(Bhag. Ch.15:1)

[He who knows the peepal tree in the form of creation which is said to be imperishable with its roots in the primeval being (God) whose stem is represented by Brahma and leaves by Vedas is a knower of the Vedas].

अधश्चोर्ध्वं प्रसृतास्तस्य शाखा गुणप्रवृद्धा

विषयप्रवालाः ।

अधश्च मूलान्यनुसन्ततानि कर्मानुबन्धानि

मनुष्यलोके ।

(Bhag. 15:2)

ऊर्ध्वमूलोऽवाक्शाख एषोऽश्वत्थः सनातनः

(Katha II 3(1))

The tree is unique, the roots are above and branches are below hence looks as though are originating from the avyaktha god himself. This tree also has been described in Bhagavatha (Ch. X ii-27) depicting the entire philosophy, physiology and the very existence of life.

एकायनोसौ द्विफलस्त्रिमूलश्चतुरसः पंचविधः

षडात्मा ।

सप्तत्वगष्टवित्तपो नवाक्षो दशच्छदि द्विखगो ह्यदि

वृक्षः ।।

The essence of the shloka includes,

1. Para-prakruti that is the supreme divine energy by which the Universe is made.
2. The two or a pair of fruits, the pain and pleasure or the joy & sorrow.
3. Three roots namely, Sattva, Rajas and Thamas.
4. Four rasas, Dharma, Artha, Kama and Moksha
5. Five senses which are the channels of knowledge

6. Six featured experiences like thirst, hunger, infatuation, infirmities of age, grief and death.
7. Seven dhatus like the chyle, flesh, fat, blood, bone, marrow and semen.
8. eight branches ie Panchabhootas and the mind, buddhi and Ahankara.
9. Navadvaras ie the seven above the neck and two at the lower end ie pair of eyes, ears, nostrils and a mouth. below are the the anus and urinogenital openings.
10. Ten vital breaths or pranas.

On this tree are perched two birds the Jeevatma and Paramatma. Attachment to this tree multiplies births and perpetuates miserable existence.

In Mahabharata Aranya parva (71-73) banyan is called Akshaya vata and being celebrated in all the three worlds "त्रिषु लोकेषु किञ्चिन्ता". In Arthashastra of Koutilya the use of banyan as an Antidote (XIII, Ch. iv :426) has been reffered.

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LET FOOD BE YOUR MEDICINE AND MEDICINE YOUR FOOD

Hippocrates, Greek Physician, Father of Medicine - (BC 3-4 cent)

Tea – a health drink

Tea with different pleasant aroma and unique taste is consumed as a stimulating beverage all over the world.

Tea (*Camelia sinensis*) is native to China and is cultivated in India and Srilanka. The medicinal effects of tea have a history dating back almost 5000 years in China. The use of tea in traditional Chinese medicine is well documented and that there is a claim that it can be used to treat about 200 illness and symptoms.

Chinese use medicine with a belief of human body as the universe. According to their belief universe is made up of two elements called “Ying” and “Yang”. “Ying” represent dark, negative and ‘cold’. “Yang” represent light, positive and hot.

As early as Shang Dynasty (1700-1027 BC) Chinese treated certain diseases with herbal bath and tea bath.

Both in east and west research on tea has revealed that tea could be used in treating many common ailments.

Jade Buddha Temple at Shanghai in China, about 10 different varieties of Tea are served. These varieties are supposed to act as medicine for different ailments.

Commercial forms of processed tea are the black tea (which is obtained by complete fermentation) green tea (without fermentation) and oolong tea (partial fermentation). A cup of tea without milk or

sugar has no calories but acts as a natural source of certain minerals and vitamins.

Chemical composition of tea :

Caffeine -Theophylline, theobromine, xanthine and hypoxanthine are extracted from tea.

Polypheols like Catechius, Carotenes like galocatechinus, Vitamin B and Ascorbic acid are also present.

Polyphenols in tea favors the growth of beneficial bacteria and decreases the development of less beneficial bacteria in the intestinal tract.

Herbal tea is becoming popular and many companies are promoting the product with a claim of medicinal value. So adding tea to our daily diet may be inexpensive way to lead a healthier life.

No mention of tea can be seen in any of the scriptures. In Rig veda Soma, the juice of a milky climbing plant (*Asclepiasacida*) and Sura, the wine or spirituous liquor as all powerful healer has been mentioned. In fact one Mandala in Rigveda, “pavamana mandala /sukta” is almost devoted to the praise and uses of Soma.

In Bible, the wine (Sir 31 : 37) has been described as the substance created to make men glad. In Iranian scripture the intoxicating drink like Hura or Hoama has been mentioned.

NAME	FUNCTION	USAGE
1. [水果茶]	A. Wakes you up	1. Half tea spoon 2. Wash tea 3. Infuse it 2 minutes 4. Drink it any time you want
2. [青玉茶]	A. Detoxification protect liver B. Lose weight - Oolong tea	1. Half tea spoon 2. Wash tea 3. Infuse it 2 minutes 4. Drink it after meal
3. [雪莲茶]	A. Against cancer B. Good for people who do chemotherapy	1. 4 petals 2. 500 ml water 3. Small fire cook 10 minutes 4. Drink the tea soup once a day
4. [干珠茶]	A. Diabetes B. Reduce sugar	1. One pinch 2. Wash tea (With cold water) 3. Infuse it 3 minutes 4. Drink it after meal
5. [阿麻茶]	A. Relaxation B. Good for sleeping C. Skin Allergy	1. 4 Leaves 2. Wash Tea 3. Infuse it 2 minutes 4. Drink it Any time
6. [银丝茶]	A. Migrain headache	1. One pinch 2. Wash tea 3. Infuse it 10 minutes 4. Drink it any time (better night, before sleep)
7. [黄果茶]	A. Arthritis B. Reduce pain of shoulder and lower back	1. One pinch 2. Wash tea 3. Infuse it 2 minutes 4. Drink it as much as you can
8. [黄莲茶]	A. Balance metabolism B. Constipation C. Indigestion stomach trouble	1. 4 flowers 2. Wash tea 3. Infuse 2 minutes 4. Drink it after meal
9. [红雪茶]	A. Arteriosclerosis B. Lower blood pressure C. Reduce cholesterol	1. One piece 2. Wash tea (with cold water) 3. Infuse 2 minutes 4. Drink it as much as you can
10. [罗汉茶]	A. Promote Immunity B. Brings you energy	1. One pinch 2. Wash Tea 3. Infuse it 2 minutes 4. Drink it Any time
Remarks : The same tea leave can be used for whole day, Just keep pouring the hot water		

TURMERIC LEAF AS A HERBAL PESTICIDE

Curcuma longa (Turmeric) is extensively used in cosmetics, cooking and is considered as one of the most versatile & benign medicine that nature has provided. The rhizome is harvested, processed and sold as fresh, dried or powdered form. The leaves are generally considered as waste. But from this waste useful products are being extracted now.

The leaf oil has monoterpenes as predominant chemical where as the rhizome part contains sesquiterpene and sesquiterpene ketones. The leaf oil could be used in perfumery, cosmetics, industries and in aromatherapy.

Both the leaf and rhizome have pesticidal, antiseptic and antibacterial properties.

DRUMSTICK - MIRACULOUS WATER PURIFIER

Moringa oleifera, is a common household tree in South India. The tender leaves are used in the preparation of soups, sauces or salads. The leaves, pods and flowers are rich in nutrients. The latest research at university of Leicester has demonstrated the use of moringa seeds in purifying water in a very short time. The research is getting funds from British overseas Development Agency & the European Union. The outcome of the research has shown that the crushed seed of Moringa being capable of attracting and stocking fast to bacterial & other viruses allowing them to be skimmed off or getting trapped in filter beds.

CHILLIES TO CHILL OUT PAIN

The spicy food on a steaming plate brings on a feeling on the nasal passage. If a very hot, spicy food is eaten the mouth is inferno, tears stream down the face & one experiences the itching & swelling.

The pungent principle in chillies is an alkaloid called Capsaicin. Its content varies for different varieties. Capsaicin has been used in the preparation of several medicines. "NO PAIN" is a high-potency capsaicin lotion. It may sting or burn on initial application. This burning sensation is harmless but may be annoying to some people. Most people will find the burning sensation somewhat pleasant and evidence of the penetrating and curative power of this amazing medicinal herb. This is a good example of the old adage, "No pain, no gain." The heat sensation becomes progressively less as one uses NO PAIN. After a week of use, most people will not be annoyed by it at all.

VEDIC CONCEPT BECOMING UNIVERSAL

Eat To Live:

New rules for schools United Kingdom LONDON, — With the increase in obesity levels among children rising to alarming levels, the British government has introduced some extraordinary measures. They've gone back to the past.

Britain can thank popular young chef Jamie Oliver and his television series "Jamie's School Dinners" for shocking the British public with revelations of the junk (it didn't even deserve the term "food") that school cafeterias put on their daily menus.

Education Secretary Alan Johnson has pledged to stop feeding children the "rubbish that they have been given for decades". Mr Johnson said the new school meals would prove popular providing they were "more attractive and healthier", and children and parents were educated about the need for better nutrition.

Pupils will be served a minimum of two portions of fruit and vegetables with every meal.

From September 2008, primary schools will be required to abide by nutrient-based standards which set out the essential vitamins and minerals children should receive.

New rules are set to end "rubbish" school meals.

While almost one in six of the estimated world population of 6.5 billion is now overweight or obese, about 800 million people do not have enough to eat, was the comment made at an international conference in Australia recently. Obesity is now affecting developing countries due to a change in diet to more fatty foods, a decline in physical work, the growth in car ownership and more hours spent in front of the television set. Overweight people run a higher risk of developing diseases such as type two diabetes, heart disease and some cancers.

"If we eat wrongly, no doctor can cure us.

If we eat rightly, no doctor is needed"

– Victor and Rocine

In to-day's scenario many people are living only 50% of their full health potential. One may not be really sick but one cannot claim that they are perfectly fit and peaceful. This is mainly because we have lost to the old traditions and have not completely understood the scientific facts. Vegetables and fruits play a significant role in the human diet and supply vitamins and minerals needed to the body. Without the proper balance of the variety of nutrient rich foods, good health cannot be achieved or maintained. Every consumable item has minus and plus points. What

**"कन्दैः फलैः मुनिवराः क्षपयन्ति कालम्
सन्तोष एव पुरुषस्य परं निधानम्"**

The great sages spend their days on roots & fruits. Contentment or happiness is the greatest wealth of men. Happiness lies in health because health is wealth.

In Bhagavadgita Sri Krishna describes 3 kinds of feeding habits.

"आहारस्यापि सर्वस्य त्रिविधः भवति प्रियः"

(Ch. xvii : 7)

They are :-

"आयुः सत्वबलारोग्यसुखप्रीतिविवर्धनाः।

रस्याः स्निग्धाः स्थिरा हृद्या आहाराः सात्विकप्रियाः।।"

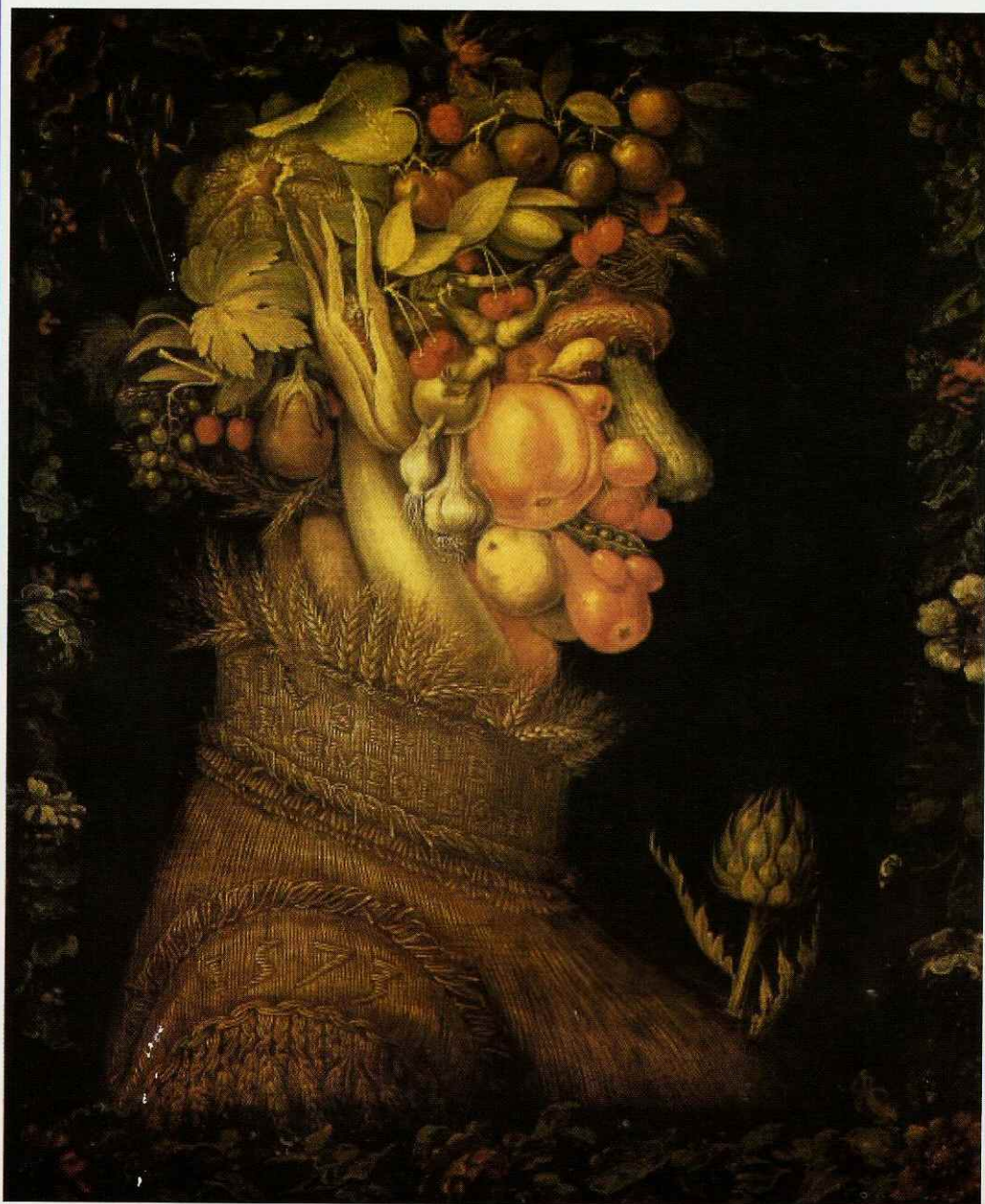
(Ch. xvii : 8)

Foods which promote longevity, intelligence, strength, health, happiness & delight, which are sweet, bland, nourishing & agreeable are dear to satvic type.

"कट्वम्ललवणात्युष्णतीक्ष्णरूक्षविदाहिनाः।

आहारा राजस्येष्टा। दुःखशोकामयप्रदाः।।"

(Ch. xvii : 9)



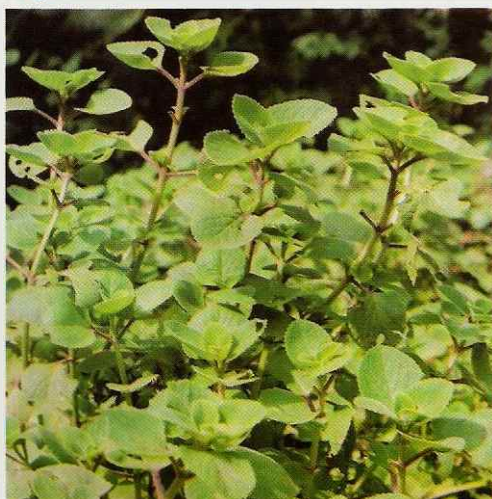
Vegetable Man



***Coleus aromaticus*
(Doddi patre)**

F: Lamiaceae

Used in treating Cold, cough and is anti-allergic.



***Rosemarinus officinalis*
(Rosemary)**

F: Limiaceae

Stimulant, mild analgesic, dandruff removal, promote growth of hair, prevent premature baldness.



Toddalia asiatica
(Kaadu Menasu)

F: Rutaceae

Prickly shrub three foliate leaves, white flower, root antipyretic, carminative, fresh leaves eaten during pain in the bowels.



***Adhatoda vasica* (Aadu sogé)**

F : Acanthaceae

Evergreen erect undershrub, stem densely appressed, leaves lanceolate. Leaves, roots and flowers are medicinal. Used in the treatment of cough, bronchitis, asthma, rheumatism.

Hemigraphis colorata
(Tincture)

F: Acanthaceae

The leaves have wound healing property. It is antiinflammatory.





← *Aristolochia elegans*
(Iswari balli)

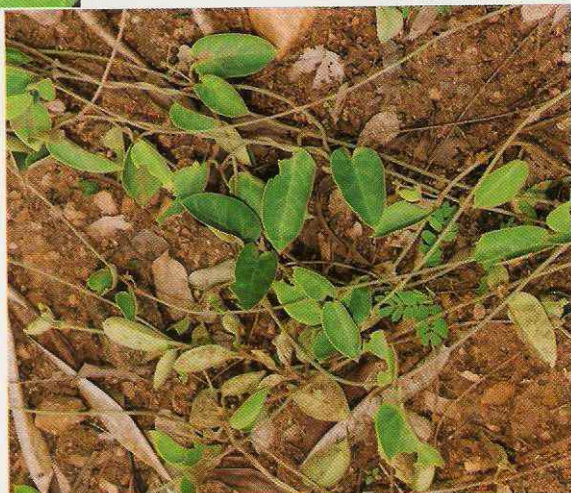
F: Aristolochiaceae

Twining herb, flower with inflated base, seeds winged. Antiarthritic, antidote for snake bite, roots rubbed with honey given for leprosy along with ginger. The root is carminative, juice of leaves used in treating cough, seeds used in inflammation.

Tylophora indica
(Adumuttada soppu) →

F: Asclepiadiaceae

Used to cure asthma, diarrhoea and hay fever.



← *Cassia tora* (Thagache)

F: Caesalpinaceae

Shrubby herb, small yellow flowers, seeds give blue dye. Antidote for snake bite. Leaf & seeds used in ringworm and other skin diseases, gives oil called "Chakramardha" and is used in curing ringworm.

Sida cordifolia
(Ummatti)

F: Malvaceae

Branched undershrub, pale yellow solitary flowers. Root is used in pain, nervous disorders and cardiac diseases.



Winthania somnifera
(Aswagandha)

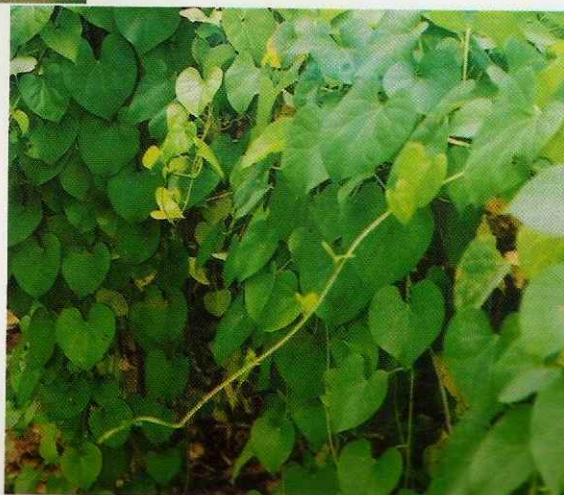
F: Solanaceae

Shrub, root is medicinal, nervine sedative, to cure sterility of women, insomnia and sore eyes.

Tinospora cordifolia
(Amrutha balli)

F: Mensipermaceae

Climber, leaves ovate and cordate. Used in gonorrhoea, skin diseases, urinary diseases, anti-diabetic. Stem and fruits are used in Jaundice. Fruit is anti-rheumatic.





Altermanthera sessilis
(Honegone)

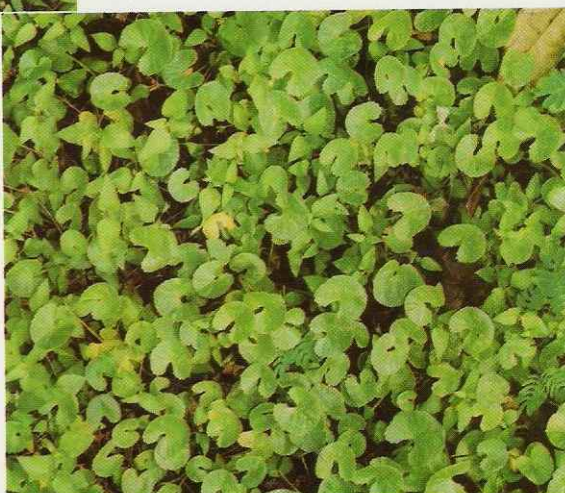
F: Amaranthaceae

Leaves rich in Vit.A. Used as vegetable. Galactagogue ie it promotes the flow of milk from mammary glands, Cholagogue ie increases bile flow in liver, abortifacient ie causes abortion. Used as hair tonic.

Centella asiatica
(Ondelaga/ Saraswathi soppu)

F: Umbelliferae

Prostrate herb, rooting at nodes, leaf reniform. Used in skin diseases, eczema, psoriasis. Leaf used to improve memory, epilepsy, polyurea, bronchial asthma and is a very good brain tonic.



Aloe vera (Lole Sara)

F: Liliaceae

Xerophyte. Red flowers. Used in preparation of gel and skin ointments.

Foods which are bitter, acidic, salted, very hot, pungent, dry, burning & giving rise to pain, grief & illness are dear to the Rajasic type.

"यातयामं गतरसं पूति पर्युषितं च यत्।
उच्छिष्टमपि चामेध्यं भोजनं तामसप्रियम्।"

(xvii : 10)

Food which is half cooked, insipid, putrid, stale and polluted and impure are Tamasic type:

A REPORT

According to WHO, 80% of world's population rely on plant based medicines. It is more so in developing countries. Most of the countries are now encouraging indigenous forms of medicine rather than relying on imported drugs. Statistics show that India and China are the largest users of medicinal plants.

Nearly about 35,000 plant species have been identified and used for medicinal purposes all over the world. Even before the complete documentation of these and many more plant species, are threatened with extinction and some are being over exploited. The need of the hour is to respect tradition, analyze the facts scientifically and act sensibly for a healthy living. Every part of the plant, the bark, stem, leaves, flower, fruit, seed, wood, root, rhizome are the store house of chemicals that are of medicinal value. In India, out of about 400 plants that are used regularly in Ayurvedic, Siddha, Unani and Tibetan medicines the % of the parts of the plant utilized for medicine is shown in the graph.

